

ROYAL BOTANIC GARDENS, KEW.

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BULLETIN  
OF  
MISCELLANEOUS INFORMATION.

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LI.—ECHIUMS FROM THE ATLANTIC  
ISLANDS: II.

T. A. SPRAGUE.

(WITH PLATES.)

The Echiiums of the Canary Islands and Madeira were arranged by Christ\* in four Series, *Simplicia*, *Virescentia*, *Gigantea*, *Stricta*, according to whether the stem was simple or branched, and to the nature of the inflorescence. De Coincy,† on the other hand, used the annulus inside the corolla and the indumentum as the basis of his classification, and placed side by side species which differ greatly in habit.

Christ's divisions seem to be more natural, and are adopted as the basis of the provisional classification given below. *E. callithyrsum* has a branched stem,‡ and is therefore transferred from the *Simplicia* to the *Virescentia*.

Ser. I. SIMPLICIA, Christ.

Subseries A. **Latifolia**. Folia lata, ovato-lanceolata vel lanceolata: *E. simplex*, *E. Pininana*.

Subseries B. **Angustifolia**. Folia angusta, lanceolato-linearia: *E. Auberianum*, *E. Wildpretii*, *E. Perezii*.

Ser. II. VIRESCENTIA, Christ.

*E. virescens*, *E. nervosum*, *E. candicans*, *E. Webbii*, *E. hierrense*, *E. onosmaefolium*, *E. callithyrsum*.

Ser. III. GIGANTEA, Christ.

Subseries A. **Sericea**. Folia plus minusve sericea: *E. giganteum*, *E. leucophaeum*, *E. Bond-Spraguei*, *E. brevirame*, *E. aculeatum*, *E. hypertropicum*.

Subseries B. **Tuberculata**. Folia valde tuberculata, haud sericea: *E. Decaisnei*, *E. gentianoides*, *E. nudum*.

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\* Engl. Jahrb. vol. ix. p. 126 (1888).

† Bull. Herb. Boiss. ser. 2, vol. iii. p. 263 (1903).

‡ Bolle in Ind. Sem. Hort. Berol. 1867, App. p. 6.

## Ser. IV. STRICTA, Christ.

*E. strictum*, *E. exasperatum*, *E. stenosphon*.

The present article deals with the species assigned to Ser. *Simplicia*, Subser. *Angustifolia*. *Echium Auberianum* was described by Webb and Berthelot in their *Phytographia Canariensis*, sect. iii. p. 42 t. 144 (1836-50), and was based on a specimen collected by P. A. Auber on the Montaña Blanca at the foot of the upper cone of the Pico de Teyde, Tenerife.

A second species, *E. Bourgaeum*, Webb, was collected by H. de la Perraudière above Guimar, Tenerife, at 2200 m., and in the Cañadas, in April and July, 1855. This was distributed in Bourgeau's *Plantae Canarienses*, 1 895 and 2 1436, but was never published by Webb, and was reduced to *E. Auberianum* by Christ in 1888.\* In 1903 it was described and carefully distinguished from *E. Auberianum* by De Coincy.†

In the previous year, however, the same species was described by Sir J. D. Hooker‡ under the name *E. Wildpretii*, H. H. W. Pearson, from a plant raised at Kew from seeds received from the late Mr. H. Wildpret. This particular plant was poorly developed, and had a thin thyrses in which the lateral cymes were exceeded by their subtending bracts. Plants subsequently raised at Kew under different treatment produced a dense thyrses with lateral cymes exceeding the bracts. According to information since received from Dr. G. V. Perez, the seeds of *E. Wildpretii* were gathered at El Sombrerito above Vilaflor, south of the Peak of Tenerife, at an altitude of about 8,000 ft.

A third species, *E. Perezii*, Sprague, a native of Palma, was described in *Kew Bull.* 1914, p. 210. This agrees in many respects with *E. Wildpretii*, from which it may be distinguished by the broad lax inflorescence, longer style-arms and other characters. *E. Perezii* is quite different in habit from *E. Wildpretii*, as may be seen from the accompanying plates of the two species growing in Dr. Perez's garden at Villa Orotava.

*Echium Auberianum* appears to be a very rare plant, whereas *E. Wildpretii* (*E. Bourgaeum*) is known from several localities. *E. Auberianum* was first discovered in 1778, by Masson,§ and was recognised as a new species by Solander, who made the following notes:—"Echium caule herbaceo foliisque lanceolatis strigosissimis aeniis staminibus corollae aequantibus. Habitat in Tenerife insula canariensi locis arenosis inter juga montium. Fr. Masson 1778." Masson's specimen of *E. Auberianum* is perhaps the finest extant; it is preserved in the British Museum herbarium. Through the kindness of Prof. Schröter in lending the *Echium* material preserved in the Botanical Museum of the Zürich Polytechnikum, a third specimen of the true *E. Auberianum* has come to light. This was collected at La Fortaleza, 2160 m., above Orotava, during the expedition to the Canary Islands conducted by Professors Rikli and Schröter in 1908. The

\* Engl. Jahrb. vol. ix. p. 126.

† Bull. Herb. Boiss. ser. 2, vol. iii. p. 2.

‡ Bot. Mag. t. 7847 (Aug. 1902).

§ Vide Webb and Berth. Geogr. Bot. p. 81.





ECHIUW WILDPRETII.



ECHIUM PEREZII



material consists merely of the base of a plant, without flowers, and much eaten by goats, but the leaves exhibit the stiff hairs and strong tubercles so characteristic of *E. Auberianum*, and there can be little doubt as to the identification. It is to be hoped that the species still survives in this locality.

*Echium Wildpretii* and *E. Perezii* are characterised by a strictly actinomorphic rose-coloured corolla, and long-exserted straight filaments, which radiate regularly from its mouth.

*E. Auberianum* is unknown in a living state; Webb and Berthelot described the corolla as blue, but this was presumably from dried material. The corolla appears to be very slightly zygomorphic; the three posterior stamens are included, and the two anterior are shortly exserted.

It should be stated that the foregoing notes are the result of an investigation commenced in 1912 on the instigation of Dr. Perez, who has sent dried specimens and photographs of *E. Wildpretii* and *E. Perezii* to Kew, and afforded valuable assistance in other directions.

#### KEY TO THE SPECIES.

Leaves hispid, strongly tubercled ... 1. *E. Auberianum*.

Leaves silky:

Style-arms 0.7 mm. long ... 2. *E. Wildpretii*.

Style-arms 1.8 mm. long ... 3. *E. Perezii*.

1. *E. Auberianum*, Webb and Berth. Phyt. Canar. sect. iii. p. 42, t. 144; Christ in Engl. Jahrb. vol. ix. p. 126 (excl. *E. Bourgaeum*, Webb); De Coincy in Bull. Herb. Boiss. ser. 2, vol. iii. p. 488.

TENERIFE. Montaña Blanca, Auber (Herb. Paris); in sandy places between mountain ridges, Masson (Mus. Brit.); La Fortaleza, 2160 m., Rikli and Schröter Expedition (Zürich Polytechn.).

2. *E. Wildpretii*, H. H. W. Pearson ex Hook f. in Bot. Mag. t. 7847 (1902); Gard. Chron. 1905, vol. xxxviii. p. 5 fig 4; l.c. 1912, lii. p. 317, Suppl. III.; E. Jahandiez in Rev. Hort. 1914, p. 349, fig. 109. *E. Bourgaeum*, Webb ex De Coincy in Bull. Herb. Boiss. ser. 2, vol. iii. p. 275; H. Schenck, Veg. Canar. Ins. p. 393, fig. 69; Bois in Bull. Soc. Acclimat. 1912, p. 719, fig. 3; Perez in Gard. Chron. 1913, vol. liiii. p. 19, fig. 16. *E. Auberianum*, Perez in Rev. Hort. 1912, p. 440, fig. 151, non Webb et Berth.

TENERIFE. Above Guimar, at 2200 m., fl. April 4, Perrandière; Cañadas, fl. and fr. July 4, Bourgeau II. 1436; Cañadas: Los Azulejos, 2200 m., fl. June, Burchard 164 (Zürich Polytechn.); El Sombrerito, above Vilaflor, about 2400 m., Wildpret's Collector.

3. *E. Perezii*, Sprague in Kew Bull. 1914, p. 210.

PALMA. Punta Llana: Barranco del Agua, Dr. Santos's Collector.

The photographs of *E. Wildpretii* and *E. Perezii* reproduced on the plates were taken by Mr. M. Benitez.

## LII.—NOTES ON FRUIT-GROWING IN THE EAST AFRICA PROTECTORATE.

H. POWELL.

The pioneering of fruit-growing on systematic lines in the early days of the East Africa Protectorate is largely due to the late Rev. Stuart Watts, of the N'gomeni Mission Station, at Mackakos, Ukamba Province.

Here, for 20 years, Mr. Watts devoted a good deal of attention to establishing what are popularly known in East Africa as European fruit trees, such as apple, plum, peach, apricot, etc.

Fruit trees were also introduced to N'gomeni from other countries outside of Europe, and in the course of time, by means of acclimatisation and selection, varieties of the several fruits were established, best suited to the climatic conditions prevailing at N'gomeni.

Ever since the establishment of the Department of Agriculture in 1903 the importance of fruit culture was recognised, and on the founding of Experimental Stations at Mazeras and Kibos the introduction, cultivation and distribution of improved varieties of tropical fruit plants has been actively carried on.

Similar attention is being given to temperate and sub-tropical fruits at the Government Experimental Farm, Kabete.

Settlers and private persons have also devoted, and are continuing to give, close attention to fruit culture throughout the Protectorate, so that ultimately data will be obtained in regard to soil and climatic conditions needed for the production of a great variety of fruit.

Frequently intending settlers are desirous among other things of obtaining information regarding fruit growing in the Protectorate, and these "Notes on Fruit Growing," by one who has had upwards of 10 years' experience in the subject in various parts of the country may perhaps be useful and interesting.

In an appendix a list is given of the fruits under trial on a property known as Mbali Sana, in the Lumbwa District of the Nyanza Province.

**Apple** (*Pyrus Malus*).—Though fairly successful at N'gomeni, apple-growing, judged from a European standpoint, cannot be regarded as satisfactory, but as time goes on and the trees become more acclimatised they may adapt themselves to local conditions and better results be obtained.

**Avocado Pear** (*Persea gratissima*).—This, as is well-known, has no affinity whatever with the ordinary pear. The tree grows vigorously and produces huge crops of fruit at Parklands, a suburb of Nairobi. Younger trees, but equally vigorous, are established in the Kedong Valley, Naivasha Province.

**Apricot** (*Prunus Armeniaca*).—Small but good-flavoured apricots are produced at N'gomeni in the Machakos Hills, but although the tree grows vigorously at Nairobi and other high-land districts, it is anything but a success from a fruiting point of view.



**Banana** (*Musa sapientum*).—The banana is found in all places suited to its growth throughout the Protectorate. Many varieties, some of which are of first-rate quality, are grown by the natives. Improved varieties have been obtained from the West Indies, India and elsewhere, and distributed widely in the country.

**Citrus.**—At various places in the coast littoral, and especially in the Changamwe District some few miles from Mombasa on the Uganda Railway, citrus trees of large size and good bearing properties are fairly common, but in regard to the orange, the fruit is generally of very inferior quality, though here and there exceptions to the rule occur. A form of the Seville orange and a rough variety of lemon are more in evidence than the sweet orange, and in the case of the rough lemon, seeds are being used by local citrus growers for the raising of stocks for receiving buds from imported improved varieties of orange trees established during the last few years in several parts of the Protectorate. Plots of budded orange trees, which include several forms of the Washington Navel and other excellent varieties, are established at the Government Experimental Farm, Kabete, near Nairobi, and at the Experimental Station, Mazaras, in the Coast District.

The bulk of the oranges imported into the Protectorate come from Zanzibar, and is a large, thin-rinded, sweet and juicy variety, but in view of the attention now being given to orange growing, it seems likely that the Protectorate will, in a few years, be in a position to supply its own requirements and possibly have a surplus for export.

Bearing trees raised from seeds of the Zanzibar orange are established at the Government Experimental Station, Mazaras, and as regards growth and the excellence of the fruit are quite satisfactory. This fact is interesting, as showing that seed-raised orange trees may be relied on to breed fairly true, yet where graded fruit is required, budded trees are undoubtedly preferable.

Small groves of choice varieties of orange have been established in the Nairobi District and other parts of the highlands. The trees commence to bear at least a year earlier than at the coast, and large handsome fruit is produced, but they have a somewhat thicker rind and are less sweet and juicy than coast-grown oranges.

Lemons of commercial varieties are also thriving around Nairobi, and samples of the fruit have been favourably reported on in Europe.

Very fine samples of grape fruit (*Citrus decumana*, var.) have also been produced at Nairobi and favourably reported on in England.

Orange, lemon, citron and lime trees are thriving and produce large crops of fruit at the Government Experimental Farm, Kibos, adjoining Lake Victoria Nyanza, and furnish a further illustration of the wide range of country over which citrus fruits can be successfully produced in the East Africa Protectorate.

**Cashew Nut** (*Anacardium occidentale*).—Common, grows to a large size and fruits abundantly in the coastal districts. The

pear-shaped fruit is borne in clusters, and when quite ripe is juicy and fairly palatable, though decidedly astringent. A single seed or "nut" is borne on the end of the fruit, and when roasted constitutes an article of food, being much liked by natives and residents generally.

**Cape Gooseberry** (*Physalis peruviana*).—Commonly met with in gardens in the midlands and highlands. The small, yellowish fruits are eaten as dessert and also made into preserve and tarts.

**Cherry** (*Prunus Cerasus*).—No progress has attended the efforts made to grow cherries in any part of the highlands.

**Fig** (*Ficus carica*).—Several varieties are grown and generally thrive well in the midlands and most of the settled districts of the uplands.

**Gooseberry** (*Ribes Grossularia*, var.) and **Currant** (*Ribes rubrum*, var., and *R. nigrum*, var.).—These bush fruits are failures, and the same may be said of garden varieties of the raspberry.

An introduced form of wild raspberry thrives in the uplands and varieties of blackberry are indigenous.

**Grape Vine** (*Vitis vinifera*).—Muscat of Alexandria, Black Hambro and other grapes have done moderately well in parts of the uplands, but further data are needed in the direction of ascertaining the localities best suited to grape culture and the varieties to be grown. Trials in grape growing are being continued at the Government Experimental Farm, Kabete, as well as by private persons interested in the subject.

**Guava** (*Psidium Guayava*).—Thrives almost everywhere, but especially well in the coast area and parts of the midlands.

**Java Plum** (*Eugenia Jambolana*).—This tree is met with here and there in the coast belt and grows to a large size. The fruits resemble damsons, and though astringent are much appreciated.

**Loquat** (*Eriobotrya japonica*).—Very satisfactory in regard to growth, bearing properties and quality of the fruit, at Nairobi and elsewhere in the uplands.

**Mango** (*Mangifera indica*).—Huge trees are plentiful in the coast belt and immediate hinterland, and bear heavy crops of fruit. There are several varieties, one of which, known as "Dodo," is considered the best and is of good flavour and practically free of fibre. Mango trees have been introduced to parts of the highlands, including Nairobi, but as yet cannot be considered a success. At Kibos, however, mango trees are growing and fruiting well.

The improvement of the mango is being taken up by the Department of Agriculture, for which purpose grafted plants of select varieties have been obtained from the West Indies for supplying grafts for "inarching" on to stocks of local seed-raised plants.



**Mulberry** (*Morus*).—A small-fruited variety is commonly grown over a large part of the Protectorate, and bears prolifically. Here and there one or two larger fruited varieties are to be found.

**Papaw** (*Carica Papaya*).—Does splendidly in the tropical parts and fairly well in the sub-tropical districts. A large variety introduced a few years ago from India is much appreciated and seeds have been widely disseminated.

**Passion Fruit, or Sweet Cup** (*Passiflora edulis*).—This is also popularly known in East Africa as the “Granadilla.” It is common in the midlands and highlands and fruits plentifully.

**Peach** (*Prunus Persica*, var.).—Several varieties from South Africa and India (Saharunpur), thrive well and produce large crops. The fruit is, however, somewhat small and of medium flavour as compared with European-grown peaches.

**Nectarines** (*Prunus Persica*, var.).—Nectarines are also fairly successfully grown in several highland districts.

**Pear** (*Pyrus communis*, var.).—Trials have been made with pears in several parts of the highlands, and though in some instances fruit has been obtained the results generally are far from satisfactory.

**Pineapple** (*Ananas sativus*).—The cultivation of improved varieties of pineapple has been made one of the features of the Government Experimental Farm, Mazeras, with very encouraging success, not only as regards the excellent size and quality of the fruit obtained, but also in the matter of the distribution of pineapple plants in various parts of the Protectorate. Fruits of the smooth Cayenne variety, weighing 10 lbs. and 12 lbs. each, are produced at Mazeras. Pineapples of good size and quality are grown in the suburbs of Nairobi, and attention is given this fruit at the Government Farms at Kabete and Kibos.

A naturalised variety of pineapple is found in a state of semi-cultivation in the coast belt, and under improved treatment at Mazeras and elsewhere the size and quality of the fruit undergoes a very marked improvement.

**Pomegranate** (*Punica Granatum*).—Widely distributed and very successful from a growth and fruiting point of view.

**Plum** (*Prunus*).—Does quite well at Machakos, Nairobi and surrounding districts, Limoru, Njoro, etc. The Japanese varieties of *Prunus triflora*, such as Kelsey, Satsuma, &c., are much in favour, though *Prunus communis*, greengage and other European varieties are grown.

**Quince** (*Cydonia vulgaris*).—Grows and fruits satisfactorily in the uplands.

**Sugar Apple** (*Anona squamosa*).—Thrives at the coast and in the warmer parts of the country generally.

**Sour Sop** (*Anona muricata*).—Does well in the hot lowlands and parts of the highlands.

**Strawberry** (*Fragaria vesca*, var.).—Alpine and garden varieties are grown in several highland localities. The fruit is of good size, but does not, as a rule, ripen thoroughly, and consequently the flavour is somewhat indifferent, judged from the standard of English garden-grown strawberries.

**Tree Tomato** (*Cyphomandra betacea*).—An unqualified success in most of the settled parts of the highlands and midlands.

LIST OF FRUITS GROWN AT M'BALI SANA, THE PROPERTY OF  
MR. ERNEST SMITH IN THE LUMBWA DISTRICT OF  
BRITISH EAST AFRICA.

This estate is situated in the Nyonda River Valley on the western bank of the river named, and is one of the best stocked fruit orchards of the Protectorate. Unfortunately, the locality is occasionally subjected to hailstorms, otherwise it is an ideal situation for fruit growing, the elevation being about 5,500 to 6,000 feet, and the soil a rich, deep loam.

Mr. Ernest Smith has budded large numbers of orange and other fruit trees at M'bali Sana, and informed the writer that July and August were the best months for carrying out this operation in the Lumbwa District.

A list of the principal fruits in Mr. Smith's orchard and garden is attached.

**Apple**.—Adam's Incomparable, American Lady, Julien, Blenheim Orange, Scarlet Pearmain, Ben Davis, Wright's Perfection, Rome Beauty, Munro's Favourite, Newton Wonder, Golden Reinette, Jonathan, Cox's Orange Pippin, Delicious, Cleopatra, Springdale, Beauty of Kent.

**Plum**.—Abundance, America, Hale, Chalco, Satsuma, Kelsey, Combination, Kerr, Mirabella.

**Peach**.—Early White, Gladstone, General Lee, Florida Crawford, Elberta, Muir, Berenice, Sneed, Dr. Hogg, Pallas; also Saharanpur peaches.

**Orange**.—Washington Navel, Thompson's Improved Navel, Navelencia, Buckeye Navel, Bahia, Du Roi, Excelsior, Golden Nugget Navel, Jaffa, Dancy Tangerine, Canton, California, Beauty of Glen Retreat, Parker's Special Mandarin.

**Loquat**.—Japanese Mammoth and others.

**Guava**.—Mountain, Yellow Chinese.

**Raspberry**.—Golden Queen, Logan Berries.

**Strawberry**.—Sensation, Alpine varieties.

**Mulberry**.—Large Black English and Russian.

**Almond** (*Prunus Amygdalus*).—Princess and others.

The following miscellaneous fruits are also being grown at M'bali Sana, Lumbwa:—

Quince (Champion), Pomegranate, Papaw, Custard Apple, Pineapple (Smooth Cayenne, Queen and other varieties), Banana (various varieties), Fig.



The following vegetables and salads thrive well at M'bali Sana:—

Bean (Broad Windsor, Dwarf Bean and Haricot varieties), Pea (Stratagem and others), Cabbage, Carrot, Potatoes, Pumpkins, Vegetable Marrow, Parsnip, Tomato, Onion, Leek, Celery, Cho-Cho, or Christophine (*Sechium edule*), Lettuce, and Radish. Rhubarb also thrives well.

### LIII.—NOTES ON THE GENERA CORDYLINE, DRACAENA, PLEOMELE, SANSEVIERIA AND TAETSIA.

N. E. BROWN.

Whilst preparing a monograph of the genus *Sansevieria* it became evident that the place assigned to it in *Haemodoraceae* by Bentham in *Bentham & Hooker, Genera Plantarum*, vol. iii. p. 679, cannot be sustained, and that its true position is in *Liliaceae*, next to *Dracaena*. Engler, in *Engler & Prantl, Pflanzenfamilien*, vol. ii. pt. 5, p. 84, has already transferred it to *Liliaceae*, though he has not laid stress upon its manifest affinity with the genus *Dracaena*. Apart from the form and fleshiness of its leaves, there is absolutely no technical character by which *Sansevieria* can be separated from *Dracaena* as that genus is at present constituted. There are shrubby and stemless species in both genera, and some species of *Dracaena* have thick coriaceous or sub-fleshy leaves, whilst the inflorescence, articulation of the pedicel, flowers, fruit and seed of *Sansevieria* are in no way different from those of many species of *Dracaena*. After having examined the whole of the Kew material and tabulated all the vegetative and structural characters in an endeavour to discover some definite distinctive character whereby *Sansevieria* might be distinguished from *Dracaena*, the writer is satisfied that although *Sansevieria* may be recognised by its appearance, yet when the details are put into words, there is no single character or combination of characters that will really distinguish all the species of *Sansevieria* from all the species of *Dracaena* as the latter genus is at present constituted. If, however, *Dracaena* be divided into two genera, in accordance with the presence or absence of a distinct tube to the perianth, then definite distinctive characters can be stated. It is, therefore, here proposed to readjust the species of *Dracaena* into two genera characterised by a structural difference in their flowers.

The genus *Dracaena* was founded in 1768 by Vandelli upon the well-known *D. Draco*, Linn., of the Canary Islands, in a very rare work entitled *Dissertatio arbore Draconis*, which is reprinted in Roemer, *Scriptores*, pp. 39-46 and 58, t. 2<sup>a</sup>, 2<sup>b</sup>. In this plant the perianth is divided into six segments nearly to the base, without any very evident tube, except such as may be formed by the mere overlapping of the margins of the segments. Subsequently other plants have been added to this genus in which the

perianth has a distinct tube, formed by the union of its segments. These latter may be removed from *Dracaena* and placed together in a separate genus, for which we may employ the name *Pleomele* of Salisbury, *Prodromus*, p. 245, published in 1796, as being the most applicable. For although Medikus in 1786 (*Theodora*, p. 83) had already recognised their distinctness from *Dracaena*, yet the name *Terminalis* which he gave to them cannot be accepted; it is too similar to *Terminalia*, long before established by Linnæus, and is, besides, an adjective. With regard to the name *Pleomele*, there is the slight objection that of the two species placed under it by Salisbury, one is a true *Sansevieria*, and the other is (according to the synonymy and locality given) composed of two distinct species. For the *Aletris fragrans*, Linn. (*Dracaena fragrans*, Gawl.) quoted, is a native of West Tropical Africa, whilst Paterson's plant from Van Stadens River in South Africa, also quoted by Salisbury, is undoubtedly *Dracaena Hookeriana*, K. Koch. Both *D. fragrans* and *D. Hookeriana*, however, belong to one genus. If *Pleomele aloifolia*, Salisb., founded upon *Aletris guineensis*, Jacq. (*Hort. Vindobon.*, vol. i. p. 36, t. 84) be removed to the previously established genus *Sansevieria*, where it rightly belongs, because it is a synonym of *S. Jacquinii*, N.E.Br., its removal permits the legitimate use of the name *Pleomele* for *P. fragrans*, Salisb., and the numerous species allied to it. It appears, therefore, better to adopt the name *Pleomele* than to invent a new generic name.

With regard to the generic names *Sansevieria* and *Cordyline* there is much confusion. These names have been in use for more than 50 years for the plants now placed under them, and if the Vienna rule dealing with such cases be upheld there need be no change. But if the law of priority must be enforced then the name *Sansevieria* should give way in favour of *Cordyline*, which antedates it by 31 years.

The statement of the case is as follows:—The name *Cordyline* has been used by three different authors for three distinct genera. The first to give the name appears to have been Royen in 1740 (*Florae Leydensis*, p. 22), but as the plants he placed under *Cordyline* are two species of *Yucca* and one *Dracaena*, and his name is, moreover, pre-Linnean, it need not be taken into consideration.

The next to propose the generic use of the name *Cordyline* was Adanson in 1763 (*Fam. des Plantes*, vol. ii. p. 54). This is the first use of the name after the establishment of the Linnean code, and according to the characters given on p. 54, and from the synonymy on p. 543, Adanson's genus is unquestionably identical with *Sansevieria*, Thunb., and is founded upon *S. zeylanica*, Willd. and *S. lanuginosa*, Willd. In the synonymy Adanson quotes *Cordyline*, Royen, as a synonym, but, as above stated, Royen's *Cordyline* was principally founded upon species of *Yucca* and therefore quite at variance with the characters assigned by Adanson.

In 1789, or 26 years later, the name *Cordyline* was proposed by Jussieu (*Gen. Plant.* p. 49) for the plants which are at the present time placed under that generic title.



Jussieu's name of *Cordyline* is, however, antedated by that of *Taetsia*, founded upon *Dracaena ferrea*, Linn. (*Cordyline terminalis*, Kunth), published by Medikus (*Theodora*, p. 82) in 1786.

From the above it is clear that in accordance with priority the names of the two genera in question should stand as follows:—

*Cordyline*, Adans. 1763 (syn. *Sansevieria*, Thunb. 1794).

*Taetsia*, Medik. 1786 (syn. *Cordyline*, Juss. 1789).

But as at the Vienna Congress of 1905 it was decided to retain the names *Cordyline* and *Sansevieria* for use in the sense they are now employed, it is not here proposed to make any alteration with regard to them. At the same time, however, my personal view of the case would be to abolish the use of the name *Cordyline* altogether, in consequence of the great confusion connected with it, and replace it by that of *Taetsia*.

This change would cause very little inconvenience, as the species of *Cordyline* are not of great economic importance, and under cultivation are mostly known by the name of *Dracaena*.

With regard to the name *Sansevieria*, the case is different. It is a name in common use in gardens and throughout the warmer regions of the world, where various species of this genus are largely sought for on account of the very valuable fibre they yield, and a change of name for garden and commercial purposes would not be adopted.

The distinguishing characteristics of the four genera above mentioned are summarised in the following synopsis. In all of them the pedicels are jointed:—

Ovary with 2–16 ovules in each cell. Trees or shrubs. Leaves stiff or thin and flexible, but not fleshy. Flowers paniculate, usually solitary, rarely 2 or 3 together, very rarely crowded into spikes, each with one bract and 2 bracteoles forming an involucre at its base ... ..

**Cordyline.**

Ovary with 1 ovule in each cell. Each flower with only 1 bracteole or 1 bract and 1 bracteole at its base, but when the flowers are clustered the bracts and bracteoles are mingled with the pedicels.

Perianth divided into 6 segments nearly to the base, without an evident tube except such as is formed by the overlapping margins of the segments. Trees or shrubs. Leaves thick and rigid or sub-fleshy, stiffly coriaceous or thin and flexible. Flowers paniculate, arranged in clusters at the nodes of the branches. Filaments of the stamens thickened at the middle ... ..

**Dracaena.**

Perianth with the segments united below into a distinct tube at least one-third as long as or sometimes longer than the lobes. Flowers paniculate or in a spike-like raceme along an unbranched axis or in a dense spike or head, solitary or in pairs or clusters. Filaments of the stamens filiform.

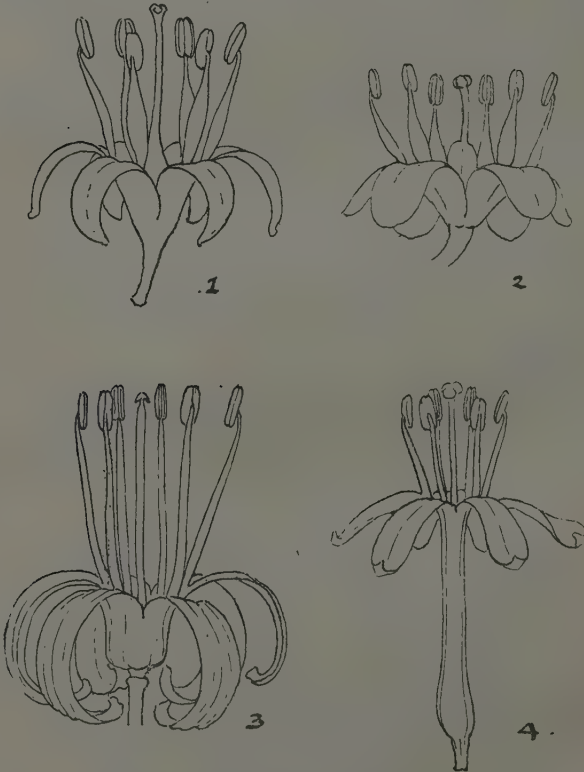
Trees, shrubs or undershrubs with woody or sub-woody stems or stemless plants. Leaves flat, thin or thinly coriaceous, stiff or flexible, usually with an evident and prominent midrib beneath, never fleshy...

**Pleomele.**

Shrubs with fleshy fibrous stems or stemless plants, with a thick creeping rootstock. Leaves cylindric, laterally compressed, half-cylindric or flat, fleshy or fleshily coriaceous, rigid, firm or flexible, without or with a very inconspicuous midrib beneath ... ..

**Sansevieria.**

To indicate further the difference between the flowers of *Dracaena* and those of *Pleomele*, drawings of two species of each genus are added. The flowers of nearly all the species of *Pleomele* are of the type represented by fig. 4, *P. fragrans* (from a



1. *Dracaena Draco*, Linn.  $\times 5$ .
2. *Dracaena yuccaefolia*, Ridl.  $\times 5$ .
3. *Pleomele floribunda*, N.E.Br.  $\times 2$ .
4. *Pleomele fragrans*, Salisb.  $\times 2$ .



specimen collected by Talbot, No. 1412), whilst that of fig. 3, *P. floribunda*, is quite exceptional, and has relatively the shortest tube of any flower in the genus.

As above characterised, I would refer the species enumerated below to the genera *Dracaena* and *Pleomele* respectively. The list given, however, is not complete, as it only embraces the species of which specimens contained in the Kew Herbarium have been examined. Several others probably belong to the genus *Pleomele* and possibly some to *Dracaena*, whilst others, only known as garden plants, may belong to the genus *Cordyline*. The three species, *Dracaena brachyphylla*, *D. Helferiana*, and *D. pachyphylla*, here placed under *Pleomele*, are all described by Kurz in Journ. Asiat. Soc. Bengal, vol. 42, pp. 248-249, as having the perianth divided "almost to the base." This is clearly a mis-statement. His types are at Kew, and as *D. pachyphylla* has a distinct tube about as long as the lobes and *D. Helferiana* a distinct tube half as long as the lobes, I have very little doubt that *D. brachyphylla* also has a tube, the specimen, however, is without flowers, but has every appearance of belonging to *Pleomele*.

### ***Dracaena, Vandelli.***

*americana*, Donn. Sm.

*Cinnabari*, Balf. f.

*Draco*, Linn.

*Ombet*, Kotschy.

*Saposchnikowii*, Regel.

*schizantha*, Bak.

*serrulata*, Bak.

*yuccaefolia*, Ridl.

### ***Pleomele, Salisbury.***

*acaulis*, N.E.Br. (*Dracaena acaulis*, Bak.)

*acutissima*, N.E.Br. (*D. acutissima*, Hua.)

*Afzelii*, N.E.Br. (*D. Afzelii*, Bak.)

*angustifolia*, N.E.Br. (*D. angustifolia*, Roxb.)

*arborea*, N.E.Br. (*D. arborea*, Link.)

*atropurpurea*, N.E.Br. (*D. atropurpurea*, Roxb.)

*aurantiaca*, N.E.Br. (*D. aurantiaca*, Wall.)

*aurea*, N.E.Br. (*D. aurea*, Mann.)

*Bakeri*, N.E.Br. (*D. Bakeri*, S. Ell.)

*bicolor*, N.E.Br. (*D. bicolor*, Hook.)

*brachyphylla*, N.E.Br. (*D. brachyphylla*, Kurz.)

*brachystachys*, N.E.Br. (*D. brachystachys*, Hk.f.)

*Braunii*, N.E.Br. (*D. Braunii*, Engl.)

*camerooniana*, N.E.Br. (*D. camerooniana*, Bak.)

*Cantleyi*, N.E.Br. (*D. Cantleyi*, Bak.)

*cerasifera*, N.E.Br. (*D. cerasifera*, Hua.)

*cincta*, N.E.Br. (*D. cincta*, Bak.)

*congesta*, N.E.Br. (*D. congesta*, Ridl.)

*congoensis*, N.E.Br. (*D. congoensis*, Hua, not *congolensis* as printed in *Index Kewensis*.)

*cuspidibracteata*, N.E.Br. (*D. cuspidibracteata*, Engl.)

- cylindrica*, *N.E.Br.* (*D. cylindrica*, Hook. f.)  
*densiflora*, *N.E.Br.* (*D. densiflora*, Bak.)  
*deremensis*, *N.E.Br.* (*D. deremensis*, Bak.)  
*elegans*, *N.E.Br.* (*D. elegans*, Hua.)  
*Elliotii*, *N.E.Br.* (*D. Elliotii*, Bak.)  
*elliptica*, *N.E.Br.* (*D. elliptica*, Thunb.)  
*falsa*, *N.E.Br.* (*Sansevieria flexuosa*, Hassk. in *Tijdschr. Natur. Geschied en Phys.* vol. ix. p. 135, not of Blume.)  
*flexuosa*, *N.E.Br.* (*Sansevieria flexuosa*, Blume)  
*floribunda*, *N.E.Br.* (*D. floribunda*, Bak.)  
*Fontainesiana*, *N.E.Br.* (*D. Fontainesiana*, Schult.)  
*fragrans*, *Salisb.* (*D. fragrans*, Gawl.)  
*fruticosa*, *N.E.Br.* (*D. fruticosa*, C. Koch.)  
*gabonica*, *N.E.Br.* (*D. gabonica*, Hua.)  
*gazensis*, *N.E.Br.* (*D. gazensis*, Rendle.)  
*glomerata*, *N.E.Br.* (*D. glomerata*, Bak.)  
*Godseffiana*, *N.E.Br.* (*D. Godseffiana*, Sander.)  
*Goldieana*, *N.E.Br.* (*D. Goldieana*, Bull.)  
*gracilis*, *N.E.Br.* (*D. gracilis*, Wall.)  
*graminifolia*, *N.E.Br.* (*D. graminifolia*, Finl. & Wall. = *D. Finlaysoni*, Bak.)  
*granulata*, *N.E.Br.* (*D. granulata*, Hk. f.)  
*Griffithii*, *N.E.Br.* (*D. Griffithi*, Regel.)  
*Hanningtonii*, *N.E.Br.* (*D. Hanningtoni*, Bak.)  
*Helferiana*, *N.E.Br.* (*D. Helferiana*, Wall.)  
*Heudelotii*, *N.E.Br.* (*D. Perottetii*, var. *minor*, Bak.)  
*Hookeriana*, *N.E.Br.* (*D. Hookeriana*, C. Koch.)  
*humilis*, *N.E.Br.* (*D. humilis*, Bak.)  
*interrupta*, *N.E.Br.* (*D. interrupta*, Bak.)  
*Kindtiana*, *N.E.Br.* (*D. Kindtiana*, De Wild.)  
*Kirkii*, *N.E.Br.* (*D. Kirkii*, Bak.)  
*Kochiana*, *N.E.Br.* (*D. Kochiana*, Regel.)  
*Lecomtei*, *N.E.Br.* (*D. Lecomtei*, Hua.)  
*linearifolia*, *N.E.Br.* (*D. linearifolia*, Ayres.)  
*Maingayi*, *N.E.Br.* (*D. Maingayi*, Hook. f.)  
*Mannii*, *N.E.Br.* (*D. Mannii*, Bak.)  
*marginata*, *N.E.Br.* (*D. marginata*, Lam.)  
*marmorata*, *N.E.Br.* (*D. marmorata*, Bak.)  
*mayumbensis*, *N.E.Br.* (*D. mayumbensis*, Hua.)  
*Melleri*, *N.E.Br.* (*reflexa*, var. *salicifolia*, Bak., not *D. salicifolia*, Regel.)  
*monostachya*, *N.E.Br.* (*D. monostachya*, Bak.)  
*nitens*, *N.E.Br.* (*D. nitens*, Welw.)  
*nutans*, *N.E.Br.* (*D. nutans*, Ridl.)  
*pachyphylla*, *N.E.Br.* (*D. pachyphylla*, Kurz.)  
*Papahu*, *N.E.Br.* (*D. Papahu*, Engl.)  
*parviflora*, *N.E.Br.* (*D. parviflora*, Bak.)  
*Perottetii*, *N.E.Br.* (*D. Perottetii*, Bak.)  
*petiolata*, *N.E.Br.* (*D. petiolata*, Hook. f.)  
*phanerophlebia*, *N.E.Br.* (*D. phanerophlebia*, Bak.)  
*phrynioides*, *N.E.Br.* (*D. phrynioides*, Hook.)  
*Poggei*, *N.E.Br.* (*D. Poggei*, Engl.)



Porteri, *N.E.Br.* (*D. Porteri*, Bak.)

Porteana, *N.E.Br.* *Folia* sessilia, 50–60 cm. longa, 15–17 cm. lata, linearia, attenuato-acuminata, costa subtus insigniter prominente. *Flores* ignoti.

This is the plant referred by Baker in Journ. Linn. Soc. vol. 14, p. 540, to *Cordyline terminalis*, Kunth, but it bears no resemblance to the broad oblong-lanceolate petiolate leaves of that plant and is evidently closely allied to *Pleomele cincta*, but is well distinguished by its longer leaves and the remarkably prominent midrib. Flowers are unknown, but I have little doubt that it is a true *Pleomele*.

prolata, *N.E.Br.* (*D. prolata*, Wright.)

reflexa, *N.E.Br.* (*D. reflexa*, Lam.)

robusta, *N.E.Br.* (*D. robusta*, Ridley.)

salicifolia, *N.E.Br.* (*D. salicifolia*, Regel, not *D. reflexa*, var. *salicifolia*, Bak.)

Sanderiana, *N.E.Br.* (*D. Sanderiana*, Sander.)

siamica, *N.E.Br.* (*D. siamica*, Ridl.)

silvatica, *N.E.Br.* (*D. silvatica*, Hua.)

Smithii, *N.E.Br.* (*D. Smithii*, Bak.)

Soyauxiana, *N.E.Br.* (*D. Soyauxiana*, Bak.)

spicata, *N.E.Br.* (*D. spicata*, Roxb.)

Steudneri, *N.E.Br.* (*D. Steudneri*, Engl.)

surculosa, *N.E.Br.* (*D. surculosa*, Lindl.)

Talbotii, *N.E.Br.* (*D. Talbotii*, Rendle.)

thalioides, *N.E.Br.* (*D. thalioides*, Makoy.)

Tholloniana, *N.E.Br.* (*D. Tholloniana*, Hua.)

Thwaitesii, *N.E.Br.* (*D. Thwaitesii*, Regel.)

timorensis, *N.E.Br.* (*D. timorensis*, Kunth.)

ugandensis, *N.E.Br.* (*D. ugandensis*, Bak.)

umbraculifera, *N.E.Br.* (*D. umbraculifera*, Jacq.)

usambarensis, *N.E.Br.* (*D. usambarensis*, Engl.)

viridiflora, *N.E.Br.* (*D. viridiflora*, Engl.)

xiphophylla, *N.E.Br.* (*D. xiphophylla*, Bak.)

## LIV.—CONTRIBUTIONS TO THE FLORA OF SIAM.

### ADDITAMENTA VII.

**Lepisanthes siamensis**, Radlk. [Sapindaceae-Lepisantheae]; ante fructum notum dubitanter generi *Sapindo* adscripta (*Sapindus?* *siamensis*, Radlk.), nunc fructu obvio, cum *Lepisanthe mekongensi*, Pierre, *Lepisanthis* sectionem constituit, sectionibus *Eulepisanthes*, *Scorododendron* et *Anomosanthes* (cf. Radlk. in Sap. Holl.-Ind., 1877, p. 104 (34) sqq. et in Engler et Prantl Nat. Pflanzenfam., iii. 5 (1895) p. 320) sub nomine *Anomorrhiza adjungendam*, insignem embryonis radícula punctiformi ad

seminis latus ventrale (nec dorsale ut e.g. in *L. tetraphylla*, Radlk., cf. fig. 165 in Engler et Prantl, l.c.) paulo infra medium sita (cf. Pierre, Fl. For. Cochinch., t. 326A, fig. 13), verbis sequentibus circumscribendam:—

Section IV. *Anomorrhiza*, Radlk. *Discus* unilaterialis, semilunaris, (glaber). *Petala* 4, squamis cristatis aucta. *Cotyledones* oblique superpositae; radícula punctiformis, infra hilum ventralis (cf. Radlk. in Engl. u. Pr. Nat. Pflanzenf., Nachtr. iii. Lief. 3, p. 203).

Character speciei ut loco infra citato, addenda fructus descriptione:—

*Fructus* indehiscens, trilocularis, trigono-globosus, trisulcato-lobatus, 5 cm. diametro, hirtello-tomentosus, intus glaber, pericarpio carnosio cellulis magnis crebris gummi-resina quadam (nec in alcohol nec in aqua, sat facile viro, etsi incomplete, in alcohol aquoso solubili) foetis persito sicco indurato crustaceo rubro-fusco 1-1.5 mm. crasso, endocarpio collenchymatico. *Semen* ellipticum, a lateribus compressiusculum, 4 cm. longum, 1 cm. latum, 2 cm. crassum, pilis brevibus aureo-splendentibus (sat amplis pachydermiosi) perlaxe adpersum, testa crassiuscula coriaceo-crustacea fusca, hilo longitudinali notata, intus pallidiore laevi reticulato-venosa; embryo carnosus, quodammodo curvatus; cotyledones crassae, oblique superpositae, superiore majore (plano commissurali a micropyle supra basin ventrali fere ad tertiam seminis dorsi partem superiorem adscendente), granulis amyli compositis (in fragmenta 5-9 partitis) farctae; radícula infra hilum ventralis, punctiformis.—*Sapindus?* *siamensis*, Radlk. in Kew Bull. 1912 p. 265 et apud Craib, Contrib. Fl. Siam in Aberd. Univ. Studies, No. 57 p. 45.

Prê, 156-260 m., *Luang Vanpruk* 119, 191; Prê, Mê Chwa, 150 m., *Luang Vanpruk*; Lakawn, in savannah, 240 m., *Kerr* 2563.

*Delpya muricata*, Pierre emend. Radlk. in Lecomte Not. Syst. i. p. 304 [Sapindaceae—Cupanieae, uti nunc fructu maturo cognito patet in qua tribu ob calycis et disci unilaterialis indolem juxta genus *Diploglottis* collocanda videtur].

Fructus descriptio l.c. secundum fructum vix semimaturum a Pierre lectum elaborata, nunc secundum fructum maturum a Kerr nuperrime lectum emendanda est ut sequitur.

*Fructus* capsularis, *Aesculi* fructum aemulans, processibus ad 2 cm. longis echinatus, his exclusis 4 cm. diametens, 3-locularis, 3-valvis, axe nullo relicto; valvae dorso sulco longitudinali exaratae, intus septiferae, 4-6 mm. crassae, corticosae, radiatim dense fibrosae, siccae induratae, toto dorso in processus crebros subulato-filiformes rigidos apice flexibiles rubiginoso-pilosos glandulisque resini ornatos productae et inter hos tomento rufo glandulisque indutae, intus materia gummoso-resinosa illitae. *Semina* in loculis solitaria (partim abortiva), erecta, obovoidea, 18 mm. longa, ad 12 mm. lata et crassa, strato gummoso-resinoso (arillo? vel testae parte carnosae?) obducta, intus plica testae a basi adscendente in loculamenta 2 incomplete partita (uti *Schleicheriae*

semina), loculamento inferiore ampliore, testa modice crassa subossea, parte inferiore reticulato-venosa solubili embryoni arcte adhaerente, hilo prope basin laterali; embryo curvatus, notorhizus, cotyledonibus crasse carnosus oleo et aleuro foetis inter se arcte cohaerentibus parte dimidia inferiore (cum radícula) loculamentum seminis amplius inferius explentibus ceterum inaequalibus, dorsali parum curvata, ventrali-apice hamato curvata et in loculamentum superius inflexa, radícula minuta breviter conica.

Mê Ping Rapis, Ok Ma, 130 m., *Kerr* 2187; Hue Paka, 150 m., *Kerr* 2955; Lampun, 360 m., *Kerr* 2552; Bangkok, *Zimmermann* 123; Prê, 18 m., *Luang Varpruk* 276,452; Petchabouri (ex. *Fl. Indo-Chine*).

Genus ob fructum capsularem, uti nunc patet, in Sapindacearum subserie "Eusapindaceae anomophyllae" Cupaneis adsociendum, in qua tribu ob calycis et disci unilateratis indolem juxta genus "Diploglottis" collocandum videtur. Ceterum disco in marginem cyathiformem elevato et pericarpio echinato crasso radiatim fibroso *Paranephelium* in mentem revocat.

**Kalanchoe Craibii**, *Raymond Hamet* [Crassulaceae]; *K. laciniatae*, DC., *K. macrosepalae*, Hance et *K. gracili*, Hance, affinis, sed sepalorum forma valde distincta.

*Caulis* erectus, robustiusculus, simplex, glaber, sed apice pilosus. *Folia* opposita; lamina a basi trisecta; petiolus lamina brevior, graciliusculus, basi dilatatus. *Inflorescentia* caulis non distincta, corymbiformis, in cymis subsimplicibus. *Pedicelli* corollae tubo breviores. *Calyx* subcampanulatus, pilosus, segmentis tubo 1.2 mm. longo longioribus late lineari-sublanceolatis acuto-acuminatis 8.6 mm. longis 2.6-2.75 mm. latis. *Corolla* subtubulosa, in dimidium inferiorem dilatata et basi coarctata, segmentis tubo 10.6 mm. longo paulo brevioribus obovato-suborbicularibus abrupte subcuspidatis 10.6 mm. longis, 7.1 mm. latis. *Stamina* supra corollae tubi medium inserta; antherae superiores, corollae segmentorum basem subattingentes. *Carpella* conniventia, ovato-lanceolata, in stylos conniventes 2.3 mm. longos quam carpella 9.5 mm. longa, 3.6 mm. lata breviores attenuata. *Squamae* lineares, acutiusculae, 3.5 mm. longae, 0.2 mm. latae.

Lampun, dry scrub jungle, 300 m., *Kerr* 2823.

**Kalanchoe Dixoniana**, *Raymond Hamet* [Crassulaceae]; *K. grandiflorae*, Wight et Arn., affinis sed distinctissima.

*Caulis* erectus, robustiusculus, simplex, glaber. *Folia* opposita, glabra, petiolo lato 2.3 cm. longo a lamina vix distincto suffulta; lamina obovata, obtusa, 11 cm. longa, 3.2 cm. lata, marginibus leviter crenatis. *Inflorescentia* caulis non distincta, corymbiformis, cymis pauciramosis; pedicelli corollae tubo breviores. *Calyx* pilosus, subcampanulatus, tubo 1.3 mm. longo, segmentis subdeltoideis actuo-subacuminatis 5.5 mm. longis 2.5 mm. latis. *Corolla* subtubulosa, in dimidium inferius dilatata et basi coarctata, tubo 12 mm. longo, segmentis ovato-lanceolatis sensim subcuspidatis 7.5 mm. longis 3.25 mm. latis. *Stamina* supra corollae tubi medium inserta; antherae superiores corollae segmentorum basem paulo superantes. *Carpella* conniventia, ovato-lanceolata, in stylos conniventes 2.3 mm. longos attenuata, 8 mm.



longa, 2.5 mm. lata. *Squamae* lineares, valde emarginatae, 2.6 mm. longae, 0.6 mm. latae.

Doi Chieng Dao, on rocks 1650-1770 m., *Kerr* 2876. Cult. Hort. Trin. Coll., Dublin.

**Lagerstroemia Collinsae**, *Craib* [Lythraceae-Lythreae]; *L. calyculatae*, Kurz et *L. Balansae*, Koehne, affinis, sed foliis minoribus facile distinguenda.

*Ramuli* primo stellato-pubescentes, cito glabri, cortice cinereo-brunneo obtecti. *Folia* lanceolata, oblongo-lanceolata vel ovato-lanceolata, apice acuminata, summo apice obtusa, basi cuneata vel rotundato-cuneata, usque ad 7.5 cm. longa et 3.5 cm. lata, mox subcoriacea, juventute pagina utraque stellato-pubescentia, cito omnino glabra, nervis lateralibus utrinque 8-9 intra marginem anastomosantibus supra conspicuis leviter immersis, subtus prominentibus, nervis transversis reticulationem subgracilem in foliis maturis formantibus, petiolo circiter 4 mm. longo supra late haud altius canaliculato mox glabro suffulta. *Bracteae* angustae, alabastra ochraceo-tomentosa subaequantes. *Calycis* infructescentis tubus 8 mm. longus; lobi 6, deltoidei, acuti, usque ad 6 mm. longus et 4.5 mm. latus, intra superne cinereo-tomentosi. *Petala* oblongo-ovata, apice rotundata, 2 cm. (ungue 4 mm. longo incluso) longa, circiter 9 mm. lata. *Fructus* pedicello 2.5 mm. longo ut calyce pilis arboreo-ramosis ochraceo-tomentoso suffultus, 12 mm. altus, 10 mm. diametro, fuscus, apice cinereo-tomentosus.

Sriracha, edge of bank above beach, 4.5 m., *Mrs. D. J. Collins* 38. 190.

Siamese name (of timber), Kra bek.

**Beaumontia Murtonii**, *Craib* [Apocynaceae-Echitideae]; a *B. breviflora*, Oliver, cui affinis, sepalis angustioribus facile distinguenda.

*Frutex* volubilis; ramuli primo densius ferrugineo-furfuracei, mox glabri, cortice cinereo sparse lenticellato obtecti. *Folia* oblonga vel oblongo-ob lanceolata, apice breviter obtuse acuminata, basi cuneata, usque ad 20 cm. longa et 8.5 cm. lata, subcoriacea, supra primo puberula, mox glabra, subtus pallidiora, sparsius molliter breviter pubescentia, nervis lateralibus utrinque circiter 16 rectis intra marginem anastomosantibus pagina superiore parum impressis inferiore prominentibus, nervis transversis inter se subparallelis satis remotis subtus prominulis supra parum impressis, petiolo validiusculo circiter 1 cm. longo suffulta. *Panicula* terminalis, ad 13 cm. longa, floribus albis (ex *Kerr*); bracteae deciduae, circiter 1.5 cm. longae; pedicelli sub anthesin circiter 4 cm. longi, ut ramuli ferruginei. *Sepala* lanceolato-oblonga, acute acuminata, vix 4 cm. longa, 1.4 cm. lata, utrinque sed inferne mediumque versus puberula, lateribus plus minusve oblique plicatis. *Corolla* alba (ex *Kerr*); tubi pars basalis cylindrica vix 2 cm. longa, extra densius tomentella, pars expansa circiter 5 cm. longa; lobi circiter 4 cm. longi et lati, intus apicem versus et extra puberuli. *Filamenta* 3.5 cm. longa, glabra, antheris in toto 1.3 cm. longis. *Ovarium* depressum,

disco subaequaltum, dense ferrugineo-tomentellum; stylus inferne pilis brevibus hic illic instructus.—*Beaumontia* sp. n., Craib in Kew Bull. 1911 p. 415 et Contrib. Fl. Siam in Aberd. Univ. Studies No. 57 p. 131.

Kow Hoo Wen, Murton 113. Sriracha, Nawng Yai Bu, 15 m., in old clearing, Kerr 2676.

**Premna Collinsae**, Craib [Verbenaceae-Viticeae]; a *P. striata*, Craib, floribus minoribus recedit.

*Ramuli* puberuli, mox straminei, striati, pauci-lenticellati, ad 3 mm. diametro. *Folia* oblonga, ovato-oblonga vel elliptica, basi cuneata vel acuminata, apice acuminata, mucronata vel acuta, rarius obtusiuscula, 5-11.5 cm. longa, 2.5-7.2 cm. lata, chartacea vel membranaceo-chartacea, pagina superiore costa nervisque marginemque versus sparse puberula, inferiore costa nervisque puberula, nervis lateralibus utrinque 4-5 intra marginem anastomosantibus supra conspicuis vel saepe parum impressis subtus prominentibus, nervis transversis pagina utraque conspicuis, margine integra; petioli foliorum oppositorum inaequales, 1-5 cm. longi, puberuli, supra canaliculati. *Cymae* in corymbos et ramulos et ramulos breves laterales terminantes ad 5 cm. longas et 8 cm. diametro dispositae, partibus omnibus densius adpresse breviter pallide pubescentibus; bractae inferiores ad 3 mm. longae; ramuli inferiores oppositi, ad 3 cm. longi; pedicelli calyce breviores. *Calyx* circiter 2 mm. longus, subaequaliter 5-lobatus, lobis usque ad 0.75 mm. longis. *Corolla* extra superne parce puberula, intra dense pilosa, tubo vix 2 mm. longo lobis 4 subaequilongo. *Stamina* exserta. *Stylus* stamina paulo superans.

Sriracha, 3 m., Mrs. D. J. Collins 109.

**Premna dubia**, Craib [Verbenaceae-Viticeae]; *P. micranthae*, Schauer, habitu similis sed calyce majore, foliis supra costa nervisque puberulis vel fere glabris differt.

*Frutex* ramulis puberulis mox teretibus cortice stramineo striato pauci-lenticellato obtectis. *Folia* forma variabilia, saepissime oblonga vel elliptica, apice plerumque acuminata, acuta vel obtusa, rarius retusa, basi cuneata vel rotundata, integra, 5.5-12.5 cm. longa, 3.5-7.5 cm. lata, chartacea, supra in costa nervisque sparse puberula vel fere glabra, subtus in costa nervisque puberula, nervis lateralibus utrinque 5-6 rectis satis obliquis intra marginem anastomosantibus supra conspicuis subtus prominentibus, nervis transversis subtus prominulis; petioli foliorum oppositorum inter se haud aequales, usque ad 3.2 cm. longi, puberuli, supra canaliculati. *Corymbi* ramulos breves laterales terminantes, circiter 5 cm. longi et 8 cm. diametro, densius puberuli; bractae infimae at 4 mm. longae; pedicelli calyce parum breviores vel ei subaequilongi. *Calyx* 1.75 mm. longus, bilabiatus, lobis duobus majoribus late deltoides obtusiusculis vix 0.5 mm. longis, ceteris minutis. *Corolla* extra superne puberula, intra dense albo-pilosa, tubo 1.75 mm. longo, lobis 4 oblongis apice rotundatis tubo longioribus. *Stamina* 4, exserta. *Pistillum* glabrum, stylo staminibus subaequalto.

Lakawn, common in scrub jungle, 225 m., Kerr 2562.

**Clerodendron Lloydianum**, *Craib* [Verbenaceae-Viticeae]; a *C. Godefroyi*, O. Kuntze, foliis majoribus facile distinguendum.

*Frutex*, ramulis pallide viridibus densius albo-pubescentibus. *Folia* oblongo-oblancheolata vel oblanceolata, apice acuminata, acutiuscula, basi cuneata vel cuneato-rotundata, 15-30 cm. longa, 5-8.5 cm. lata, chartaceo-membranacea, supra pilis albis transverse septatis longiusculis tenuiter instructa, infra pallidiora, molliter pubescentia, ciliata, remote denticulata integrave, nervis lateralibus utrinque 8-10 pagina superiore conspicuis inferiore prominulis, nervis transversis paucis infra vix prominulis, petiolo 2.7-4.5 cm. longo ut ramulis pubescente suffulta. *Calyx* utrinque pubescens, tubo 1.5 mm. longo, lobis lanceolatis superne attenuatis acutis 5-5 mm. longis circiter 2 mm. latis. *Corollae* tubus vix 1.5 cm. longus, superne extra puberulus; lobi anguste obovati, inferne attenuati, 8 mm. longi, 4.5 mm. lati, extra puberuli. *Stamina* exserta, filamentis glabris, antheris 2.5 mm. longis basi sagittatis. *Stylus* staminibus subaequaltus; ovarium 1 mm. altum. *Fructus* 1 cm. altus, calyce in fructu 2.5 cm. diametro.

Prê, 180 m., *Phra Vanpruk* 499.

**Sauropus Garrettii**, *Craib* [Euphorbiaceae-Phyllanthaeae]; foliorum forma texturaque distinguendus.

*Ramuli* graciles, primo quadrangulares, mox teretes, angulati, glabri. *Folia* ovata, ovato-lanceolata vel rarius oblonga, apice acuminata, rarius haud distincte acuminata, obtusiuscula, mucronulata, basi rotundata vel fere truncata, apices versus ramulorum magnitudine gradatim crescentia, 1.8-7.3 cm. longa, 1.4-3.2 cm. lata, chartacea vel rigide chartacea, glabra, sicco supra brunnescentia, subtus pallide viridia, nervis lateralibus utrinque 4-5 intra marginem anastomosantibus pagina utraque subconspicuis, nervis transversis paucis subobscuris, margine anguste recurva, petiolo vix 2 mm. longo suffulta; stipulae lanceolatae, acutae, 2.5 mm. longae. *Flores* viridi-lutei (ex *Garrett*). *Fl.* ♂ 6 mm. diametro, ramulis abbreviatis axillaribus parvi-bracteatis gesti; pedicelli graciles, circiter 1 cm. longi; lobi breves, rotundati. *Fl.* ♀ 9 mm. diametro, axillares, solitarii, pedicellis ad 1 cm. longis quam iis florum masculorum validioribus suffulti; segmenta 3.5 mm. longa, 2.5 mm. lata. *Fructus* paulo ultra 1 cm. diametro, pericarpio tenui stramineo.

Doi Intanon, N. by E. of the Pah Ngeam, 1155 m., *Garrett* 37.

**Sauropus orbicularis**, *Craib* [Euphorbiaceae-Phyllanthaeae]; a speciebus adhuc descriptis foliis ellipticis vel rotundatis membranaceo-chartaceis recedit.

*Caules* annui, ad 60 cm. longi, e radice perenni orti (ex *Kerr*), primo quadrangulares, mox teretes, glabri, cortice viridi obtecti. *Folia* elliptica, ovato-elliptica vel rotundata, apice rotundata mucronulata, basi rotundata vel truncato-rotundata, 1.8-3.5 cm. longa, 1.7-3.1 cm. lata, membranaceo-chartacea, pagina utraque glabra, nervis lateralibus utrinque 6-8 plerumque rectis bene intra marginem anastomosantibus cum costa supra conspicuis subtus prominentibus, nervulis supra conspicuis subtus prominulis, margine saepius parum recurvo, petiolo circiter 2 mm.



longo suffulta; stipulae circiter 1.25 mm. longae; *Fl.* ♂ 2.5 mm. diametro, pedicello gracili 3 mm. longo praeditus. *Fl.* ♀ ad 4.5 mm. diametro; pedicelli vix 2 mm. longi, basi parvi-bracteati. *Calycis* segmenta ad 1.75 mm. longa et lata, inferne attenuata. *Ovarium* apice truncatum, stylis tribus bifidis ad ovarii marginem positis.

Chiengmai, Dio Sutep, mixed jungle, 660 m., *Kerr* 2635.

***Chorizandra orientalis***, *Craib* [Euphorbiaceae-Phyllanthaeae]; a *C. pinnata*, *Wight*, inter alia foliis puberulis distinguenda.

*Suffrutex*, ramulis gracilibus primo angulatis puberulis mox teretibus glabris corticeque brunneo vel fusco-brunneo obtectis. *Folia* obovata vel elliptico-obovata, apice rotundata vel saepius parum retusa, basi cuneata, ad 1.3 cm. longa et fere 1 cm. lata, chartacea vel fere rigide chartacea, pagina utraque sparse breviter puberula, nervis lateralibus utrinque 4-5 sub oculo armato pagina utraque conspicuis, nervis transversis paucis subtus sub lente fere conspicuis, margine recurvo, petiolo 1 mm. plerumque vix attingente suffulta; stipulae pavae. *Flores* masculi circiter 1 mm. diametro, staminibus liberis perianthium fere duplo superantibus. *Capsula* depresso-globosa, 1 mm. alta, 2.5 mm. diametro; semina parva brunnea.

Mê Ping Rapids, Keng Ap Nang, abundant on limestone rocks, 180 m., *Kerr* 2946. .

## LV.—THE VARIETIES OF OIL-PALM IN WEST AFRICA.

(*Elaeis guineensis*, Jacq.)

Some particulars of the varieties of this palm were given in the *Kew Bulletin*, 1909, pp. 33-49, chiefly compiled from reports received from our Colonies in West Africa. The specimens of the palms submitted to Kew in connection with these reports were subsequently sent to Prof. O. Beccari, of Florence, for critical examination and he has recently published his results in an extensive paper, "Contributo alla Conoscenza della Palma a Olio," which appeared in *L'Agricoltura Coloniale* (Firenze) vol. viii. 1914, pp. 5 37; 108-118; 201-212; 255-270: Reprint (1914) pp. 1-76, tt. i.-xviii., to which issue the pages quoted below refer. The following statement merely correlates as far as possible the native names mentioned in the *Kew Bulletin* referred to with the varieties established by Prof. Beccari, and the names given by him to the specimens of fruits in the Museum at Kew, are included.

Perhaps the most striking of the varieties are the "King Palm" (var. *idolatraca*, Chev.) with its undivided leaves, a photograph of which has recently been sent to Kew by Mr. J. H. J. Farquhar, of the Forestry Department, Southern Provinces, Nigeria—the "white oil-palm nut" (var. *albescens*, Becc.), known so far only from the Gold Coast, the "soft-shelled nut" (var. *communis*, Chev. forma *tenera*, Becc.) and the "soft nut" or "shell-less" (var. *gracilinux*, Chev.).

**Elaeis guineensis**, Jacq. Select. Stirp. Amer. (1763) p. 280; Fl. Trop. Afr. viii. (1902) p. 125.

var. **albescens**, Becc. Contrib. alla Conosc. della Palma a Olio (L'Agric. Col. viii. 1914), p. 62.

Abe-fita or Abe-fufu (Gold Coast) *Kew Bull.* 1909, pp. 39, 40, 45, 49, ff. 16, 17; Abe-fita, Becc. l.c. t. 16, f. 5; Abefita (Abefufu) Gold Coast Colony (Imp. Inst.), Mus. Kew, 1909; Abe Fufu, Gold Coast (A. E. Evans), Mus. Kew, 1908; White Oil Palm, *Kew Bull.* l.c. pp. 41, 45.

var. **angulosa**, Becc. l.c. p. 49.

Okpörö Eyop (Eifik, Old Calabar), *Kew Bull.* l.c. pp. 37, 48, f. 7; Okoro Oyop, Becc. l.c. t. 14, f. 4; Okporokpo (Ibo), *Kew Bull.* l.c. p. 37; Ikrök Eyop (Ibibio) l.c. p. 37; Okpörö Eyop (Old Calabar), Okporokpo, Ikrok Eyop, Becc. l.c. p. 26; Okporo Oyop, Old Calabar (H. N. Thompson), Mus. Kew, 1908.

var. **Ceredia**, Chev. Les. Veget. Utiles L'Afrique Trop. Franc. vii. (1910) p. 56; Becc. l.c. p. 42, t. 9.

Adi-be (Gold Coast), *Kew Bull.* l.c. pp. 39, 40, 41, 45; Becc. l.c. p. 64, t. 16, f. 1; Osök Eyop, (Eifik, Old Calabar), *Kew Bull.* l.c. pp. 37, 48, f. 6; Osök Oyop, Becc. l.c. pp. 25, 48, 49, t. 14, f. 2; Osuku (Ibo), *Kew Bull.* l.c. p. 37; Becc. l.c. p. 25; Adésran, *Kew Bull.* l.c. p. 42; Eduege Eyop (Ibibio), *Kew Bull.* l.c. p. 37, Becc. l.c. p. 25; Adibe, Aburi, Gold Coast (W. S. D. Tudhope) Mus. Kew, 1910; Osok Oyop, Old Calabar (H. N. Thompson), Mus. Kew, 1908; Abedam-adibe, Aburi, Gold Coast (W. S. D. Tudhope), Mus. Kew, 1910.

var. **communis**, Chev. l.c. p. 47; Becc. l.c. p. 42; sub sp. *nigrescens*, var. *communis*, Chev. l.c.

Udin (Benin), *Kew Bull.* l.c. pp. 36, 37; Becc. l.c. p. 25; Ope-Pamkora (Yoruba), *Kew Bull.* l.c. pp. 36, 37; Ok-poruk-pu (Ibo) *Kew Bull.* l.c. pp. 36, 37; Becc. l.c. p. 26; Okporukpu, Akponojub, Ope Pamkora, Udin (var. *communis*), Becc. l.c. p. 26; Akponojub (Eifik, Old Calabar), *Kew Bull.* l.c. p. 38.

var. **communis**, Chev. forma **dura**, Becc. l.c. pp. 37, 52; var. *macrosperma*, Welw. Apont. p. 584; *Kew Bull.* l.c. pp. 43, 46; Becc. l.c. p. 76; var. *communis dura*, del Congo Belga, Becc. l.c. t. 15, f. 4; Abe-pa (Gold Coast), *Kew Bull.* l.c. pp. 38, 39, 40, 45, 49, f. 15; Becc. l.c. p. 52, t. 15, f. 1; Afia Okpö Eyop (Old Calabar), *Kew Bull.* l.c. pp. 37, 49, ff. 8, 9, 10; Efiia Ekpo Oyop, Becc. l.c. pp. 26, 49, 50, t. 14, f. 3; Ojina (Ibo) l.c. pp. 26, 37, 45; Efiako Eyop (Ibibio) l.c. pp. 26, 37, 45; Ak-por-ro-jub (Eifik, Ibibio), *Kew Bull.* l.c. p. 37; Becc. l.c. p. 25; Dé (djédjé) (Dahomey), *Kew Bull.* l.c. p. 42; Dé Ede or Deti.

(Togoland), *Kew Bull.* l.c. pp. 43, 45; De, Becc. l.c. t. 6, f. A; Dihohô (Angola), *Kew Bull.* l.c. pp. 43, 45, 46; Abe Pa, Gold Coast (W. S. D. Tudhope), Mus. Kew, 1908; Gold Coast (A. E. Evans), Mus. Kew, 1909; Efia Ekpo Oyop, Old Calabar (H. N. Thompson), Mus. Kew, 1908; Hard Shell Palm Nut, *Kew Bull.* l.c. p. 37; Becc. l.c. p. 25.

var. **communis**, Chev. f. **fatua**, Becc. l.c. p. 54.

Abe-dam (Gold Coast), *Kew Bull.* l.c. pp. 39, 40, 45; Becc. l.c. p. 54, t. 16, f. 4; Botanic Gardens, Aburi (W. S. D. Tudhope), Mus. Kew, 1909.

var. **communis**, Chev. f. **leucocarpa**, Becc. l.c. pp. 40, 75, *nigrescens communis (vulgaris)*, Chev. l.c. p. 5; Lolequel (Dabou, Ivory Coast), Becc. l.c. t. 7, f. B; ?Af-fiako-jub (Ibo), *Kew Bull.* l.c. pp. 36, 38, 45; ?Becc. l.c. p. 25; ?Ojuku (Eifik), *Kew Bull.* l.c. pp. 38, 45; ?Af-fiako-jub.=Ojuku (v. ?) Becc. l.c. p. 26.

var. **communis**, Chev. f. **semidura**, Becc. l.c. pp. 51, 56. Abe-tuntum (Gold Coast), *Kew Bull.* l.c. pp. 38, 39, 40, 45, 46, 49, f. 14; Becc. l.c. p. 56, t. 15, f. 3; Gold Coast (A. E. Evans), Mus. Kew, 1908; Gold Coast (W. S. D. Tudhope), Mus. Kew, 1909.

var. **communis**, Chev. f. **tenera**, Becc. l.c. pp. 38, 51; *E. nigrescens*, var. *communis*, Chev. l.c.; *E. guineensis*, Jacq, var. *microsperma*, Welw. Fl. Trop. Afr. viii. (1902) p. 125; *Kew Bull.* l.c. pp. 44, 46; Abobo-be Gold Coast), *Kew Bull.* l.c. pp. 34, 38, 39, 40, 41, 46, ff. 1, 2, 3; Becc. l.c. pp. 51, 58, t. 15, f. 2; Yue Wyiam (Gold Coast), *Kew Bull.* l.c. p. 34; Dégbakou (Dahomey), l.c. pp. 42, 46; Degbakoum (var. *communis tenera*), Becc. l.c. t. 6, f. B.; Disombé or Disombo (Angola), *Kew Bull.* l.c. pp. 43, 44, 46, 49, ff. 4, 5; Dé-débakui, Dechla (Togoland), *Kew Bull.* l.c. pp. 43, 46; Lisombe, Isombe (Cameroons), *Kew Bull.* l.c. pp. 39, 44, 46; Ausuku (Ibo), *Kew Bull.* l.c. p. 37; Becc. l.c. p. 26; A-soge-e-jub (Eifik), *Kew Bull.* l.c. pp. 37, 38; Becc. l.c. p. 26; Ope-arunfo (Yoruba), *Kew Bull.* l.c. pp. 34, 35, 36, 46; Becc. l.c. p. 26; Ivioronmila (Benin), *Kew Bull.* l.c. pp. 36, 46; Abobo-be, Botanic Gardens, Gold Coast, Mus. Kew, 1909; Soft-shelled-nut, *Kew Bull.* l.c. pp. 34, 38, 39; Thin-shelled variety, l.c. p. 46.

var. **gracilinux**, Chev. l.c. p. 64; Becc. l.c. p. 47; *E. virescens*, Chev. var. *gracilinux*, Chev. l.c.; Digumbé (Angola), *Kew Bull.* l.c. p. 43; Votchi (Dahomey) l.c. p. 42; var. (*virescens*) *gracilinux*, Chev. n.v. Sédé-Votchi, Becc. l.c. t. 12, f. B; Soft Nut, Gold Coast, Mus. Kew; Shell-less (soft nut), Gold Coast, Becc. l.c. pp. 52, 67, t. 14, f. 6.



- var. **idolatrix**, Chev. l.c. p. 57; Becc. l.c. p. 43; var. (*nigrescens*) *idolatrix*, Chev. n.v. Fadé, t. 12, f. A; *E. Dybowski*, Hua, Bull. du Mus. i. (1895); *E. Thompsonii*, Chev. in Govt. S. Nigeria, July 14, 1909, Suppl. p. 25; *E. guineensis*, var. *Thompsonii*, in "The Oil Palm and its Varieties," Farquhar (1912) p. 4; Abe Ohene (Gold Coast), *Kew Bull.* l.c. pp. 36, 39, 40; Becc. l.c. pp. 51, 68, and t. 14, f. 5; Fadé, Agoudé (Dahomey), *Kew Bull.* l.c. p. 42; Agadé, Agodé, Klude (Togoland), l.c. pp. 43, 46; Ogedudin, Ogiedi (Benin), l.c. pp. 36, 45, 49, f. 11; Becc. l.c. p. 25; Ope-Ifa (Yoruba), *Kew Bull.* l.c. pp. 35, 36, 38, 46, 49, f. 11; Abe-Ohene (Gold Coast), Mus. Kew; King Palm, *Kew Bull.* l.c. pp. 41, 42, 45; Palmier fetiche (Dahomey), l.c. pp. 41, 42; Sacred Palm (Togoland), l.c. p. 43.
- var. **intermedia**, Chev. l.c. p. 63; Becc. l.c. p. 47; var. (*virescens*) *intermedia*, Chev. n.v. Sédé di Ouidah, Becc. l.c. t. 11, f. A.
- var. **macrocarpa**, Chev. l.c. p. 54; Becc. l.c. p. 41, t. 8, f. B; *E. nigrescens*, var. *macrocarpa*, Chev. l.c.
- var. **macrocarpa**, Becc. l.c. p. 71 (sub. sp.), t. 13, f. B; No. 303 (Barter) Niger Expedition, Mus. Kew, 1859.
- var. **macrophylla**, Chev. l.c. p. 59; Becc. l.c. p. 44; *E. nigrescens*, var. *macrophylla*, Chev. l.c. p. 66; Abubube (Gold Coast), *Kew Bull.* l.c. pp. 39, 40, 41, 45; Becc. l.c. t. 16, f. 3; Abu Be, Becc. l.c. p. 60; Abubube, Gold Coast (W. S. D. Tudhope), Mus. Kew, 1909.
- var. **pisifera**, Chev. l.c. p. 55; Becc. l.c. p. 41, t. 8, f. A ("Votchi"); t. 7, f. A (var. *communis tenera* passante alla *pisifera*).
- var. **repanda**, Chev. l.c. p. 61; Becc. l.c. p. 45, t. 10, f. A (var. *repanda* Chev., di Niaouli, n.v. Sédé o Kissédé), t. B (var. *repanda*, Chev., di Adjonaja, n.v. Sédé); Abedam and Abobo-Be (Gold Coast), Becc. l.c. p. 66, t. 16, f. 6 (Abedam Cross, var. *virescens*?); Kessédé, *Kew Bull.* l.c. p. 45; Becc. l.c. p. 14; Kissédé, Sédé (Dahomey), *Kew Bull.* l.c. p. 42; ?Dihûsue (Angola), *Kew Bull.* l.c. pp. 43, 45; Abedam, Botanic Gardens, Aburi, Gold Coast, said by the natives to be a cross between Abedam and Abobobe (W. S. D. Tudhope), Mus. Kew, 1909; a variety with green tinted fruits, *Kew Bull.* l.c. p. 42.
- var. **rostrata**, Becc. l.c. p. 50, t. 15, f. 5 (v. *rostrata*?); Mbana Eyop (Old Calabar), *Kew Bull.* l.c. pp. 37, 38, 48, ff. 12, 13; Mbana Oyop, Becc. l.c. pp. 26, 50, t. 14, f. 1; Ekuebuba (Ibo), *Kew Bull.* l.c. p. 37; Becc. l.c. p. 26; Ayarambana Eyop (Ibibio), *Kew Bull.* l.c. p. 37, Becc. l.c. p. 26; Mbana Oyop, Old Calabar (H. N. Thompson) Mus. Kew, 1908.

## LVI.—THE MEXICAN HAWTHORN.

*(Crataegus pubescens, H.B.K.).*

O. STAFF.

Among the few species of *Crataegus* which inhabit the Mexican tableland one has been familiar to the people of the country for a very long time, mainly on account of its fruits which were and are still made into various kinds of preserves. Hernandez,\* who from 1571 to 1577 explored Mexico, records it under the name *Texocotl* or *Pomum saxum* (rock apple), a name which is still in use among the Mexicans, its Spanish form being *Tejocote* or *Texocote*. He says of it: "It is a medium-sized tree, with leaves like those of our apple tree, but rougher and serrate. It grows wild in the mountains, and it bristles with spines. It bears apples like our apples, but they are smaller, not larger than walnuts, yellow, quite hard before they are mature, but almost as soft as grease when ripe. Their taste is, at least to my palate, unpleasant, but many appreciate it. The seeds, which occur in triplets in each apple, are as hard as stones, half-moon shaped, rather large for the size of the apple, two angled with a conspicuous ridge on the back. They are cooked with sugar and honey in many ways, and thus become mild and not less pleasant to eat than our apples. The Mexican Indians sell them in their markets after they have let them go rotten and thereby deprived them of their raw taste. If they wish to preserve them longer in a fresh state, they sprinkle them with soda and water. The crushed stones infused with water are said to cure skin-rashes and to lower the temperature of the body, particularly if mixed with 'capolin.'"<sup>†</sup>

D. Vic. Cervantes, who was professor of botany in the City of Mexico from 1788–1829, also refers to "*Tejocote*" in his "*Ensayo à la Materia Medica vegetal de Mexico*,"<sup>‡</sup> naming it "*Mespilus mexicana*." He says of it that it grows on all the mountains of Mexico and that the fruits and seeds are astringent and corroborant. Sessé and Mociño, who explored large districts of Mexico between 1795 and 1804, likewise knew it and described it in their "*Plantae Novae Hispaniae*"<sup>||</sup> as "*Crataegus Crus galli*," or "*Texocotl*" of the Mexicans. Their description refers undoubtedly to the "*Texocotl*," whilst the references to Kalm and Miller and the statement that it also occurs in Virginia, are due to mistakes of identification. They say of it that it inhabits cool and temperate localities mainly in the neighbourhood of Mexico, and that its "berries" are sweetish-sour, edible, and used mostly for sweet preserves, as they produce an abundance of jelly which, prepared with sugar, is much relished by the Indians. It was from a drawing§ of this plant, which Sessé and Mociño had prepared, that De Candolle¶ described his *Crataegus mexicana* in 1825, placing it among the "*Species haud satis notae*." How-

\* F. Hernandez, *Opera* (ed. 1790), vol. ii. p. 508.

† *Prunus capuli*, Cav.

‡ Published in *El Estudio*, 1889 (see p. 25).

|| Published as an Appendix of *La Naturaleza*, ser. ii., vol. i. (1887–1890) and again independently in 1893.

§ De Candolle, *Calques Dessins*.

¶ De Candolle, *Prodromus*, vol. ii. p. 629.

ever, by the time the description appeared, he had been forestalled by Humboldt and Bonpland, who had come across the plant near the mines of Moran (now in the State of Hidalgo), at an altitude of 2600 m., in February, 1804. A very full description and an excellent plate were published by them in their "Nova Genera et Species"<sup>\*</sup> under the name of *Mespilus pubescens*. They knew it only in the flowering state and gave no information as to its uses. Of the more recent Mexican literature on the subject two publications may be quoted, namely, "Datos para la Materia Médica Mexicana" (1900), by Jos. Ramirez, and "Manual Terapéutico de Plantas Mexicanas" (1909) by Leop. Flores. Ramirez's account is so much vitiated by his confusion of the Mexican tree with the North American *C. Crus-galli* and *C. berberifolia*, of which he copies figures from Sargent's "Silva of North America," that little can be gleaned from it that is new or reliable; but he, too, describes the tree as common in the valley of Mexico, and we may also accept his statement that decoctions of the root are used in Mexico as an aperitive and diuretic and of the fruit as a useful pectoral. He devotes several pages to the chemistry of the root, but it is not worth while to enter into this subject here. He further states that the wood of Tejocote is used in Mexico in cabinet-making, and the stems to graft apples and pears on, since these thus become more resistant. His statement that the tree has been in cultivation for a long time may be taken to apply to the Mexican hawthorn or to *C. Crus-galli*. Flores, however, is more decided on this point, saying that "Texocotl" has "there" (that is, in Mexico) been in cultivation for a long time. Otherwise his account is merely a condensed repetition of Ramirez's observations. The plant represented by Humboldt and Bonpland's figure and Mocino and Sessé's drawing is characterised by a somewhat compact habit, due to the shortness of the leaf-bearing branches and by the more or less lanceolate (3-5.5 cm. by 1.2-2 cm.) and serrate to dentate leaves, covered beneath with a fairly conspicuous tomentum. The stipules are deciduous at an early stage, and the corymbs are rather few-flowered with thin, narrow bracts. The following specimens in the Kew Herbarium may be considered to correspond to this form:—

1. Graham, nos. 193 and 194, collected "Mexico," 1830; no. 193 bears spines; no. 194 is spineless and has the following note attached: "Cultivated. Like the wild, but no thorns, and the fruit a little larger."

2. J. Gregg, no. 618c, collected "Mexico," 1848-1849. Exactly like Graham's unarmed specimen.

3. Bourgeau, no. 50, collected at Santa Fé, in the Valley of Mexico. An unarmed fruiting specimen with gnarled branches.

4. H. Christie, received 1871, collected "Mexico."

5. C. C. Parry and Ed. Palmer, no. 228, collected in the region of San Luis Potosi, 1878. A fruiting specimen like Bourgeau's.

6. C. G. Pringle, no. 11,440, collected in open woodlands near Eslaba, Federal District, 17, ix, 1903. A fruiting branch exactly like the preceding, and a flowering branch, evidently collected at

<sup>\*</sup> Humboldt, Bonpland and Kunth, *Nova Genera et Species Plantarum*, vol. vi. p. 213, t. 555.



a different time and probably from a different plant. It has more distant larger leaves and foliaceous stipules.

It is doubtful whether this form has ever been in cultivation in Europe, or if so, it must have lost its characteristic features and passed into the condition which was early known to gardeners as *Crataegus stipulacea* and *Crataegus mexicana*, and is even now, as it seems, the only form represented in gardens. This plant possesses more or less elongated branches, and consequently a more open habit and larger leaves (up to 8 cm. by 3.5 cm.), which incline towards an oblanceolate or obovate shape with a tendency towards lobing, being at the same time less hairy than in Humboldt and Bonpland's form. The stipules and bracts are generally more developed, frequently foliaceous and more persistent, and the corymbs contain on the average more flowers. The first reference to it is in Loddiges' Catalogue for 1826 (p. 40), where the name *Crataegus stipulacea* is given without any further information. In 1835 it was figured as *C. mexicana* by D. Don in Sweet's British Flower Garden (2nd series) at t. 300. The plate represents a spineless plant—it is described as an unarmed bush—with fairly large leaves, foliaceous falcate stipules, and yellowish fruits as large as those of a medlar. It is stated in the text to have been introduced from seed received by Mr. Lambert in 1829, and to have flowered first in his garden at Boyton House, Wilts, in 1834. There was at the time some controversy\* as to the correctness of the date of introduction; but Lambert† stated that the fruits were brought to this country, with other seeds including those of *Arbutus calapensis*, and given to him by the "late Lord Napier" on his return from Mexico. This was William John, 8th Lord Napier, who died in 1834. It is probable that Lord Napier returned from Mexico in 1824 as the introduction of the *Arbutus* is generally accepted as having taken place in that year.

Several specimens must have been in existence in gardens in England as early as 1835.‡ From one of them, no doubt the one in the Horticultural Society's Garden, a plate was published by Lindley in the Botanical Register, t. 1910, in 1836. It evidently represents the same form as the one shown on t. 300 of Sweet's Flower Garden, although it bears a short barren branchlet which in the shape and size of the leaves, and their more congested arrangement, recalls the habit of the form depicted in Humboldt and Bonpland's, and in Mocino and Sesse's figures. By that time it had also found its way into France, for Spach,|| in 1834, quotes the name of "*Mespilus stipulacea*, Desf. Hort. Par.," which points to the early existence of the plant in the famous Paris garden. He couples with it as a synonym "*Crataegus stipulacea*, Loddig. Cat.," but uses the new name, "*Mespilus Loddigesiana*." His clear description leaves no doubt that he had the plant before him that was then grown in English gardens as *Crataegus stipulacea* or *C. mexicana*. He also describes the great range of variation in

\* Loudon, Gardener's Magazine, vol. xi. (1835), 473, 474.

† In Loudon, Gardener's Magazine, l.c. p. 583.

‡ See Loudon, Gardener's Magazine, xi. 474, and Loudon, Arboretum et Fruticetum Britannicum, ii. 843.

|| Spach, Hist. Nat. Veg. ii. 54.

the shape of the leaves, and points out that those of the "terminal" shoots are often pinnatifid or trifid with large cultriform persistent stipules.

Subsequently the Mexican hawthorn seems to have received little attention from the horticulturist. It continued, however, in cultivation, and probably some of the trees of the first introduction are still in existence. K. Koch,\* who in his "Dendrologie" devotes nearly three pages to the discussion of it under the names of *Mespilus mexicana* and *M. pubescens*, observes that he saw it in England as well as in France, adding that it is cultivated in Mexico, and has become very variable in the shape of leaves and as regards tomentum and fruit characters. He thought that D. Don's figure in Sweet's British Flower Garden represented the cultivated form, and that of the Botanical Register the wild. As we know it is practically certain that Don's and Lindley's plant came from the same source. He also mentions Loddiges' *C. stipulacea* as a third form distinguished by larger, slightly lobed leaves, and more or less persistent stipules, the latter, however, a character which he did not find constant in the specimens which he saw himself. He further says that he also found *Mespilus pubescens*, H. B. K., in cultivation in France; but his description of it, and the fact that he refers to it *C. subserrata* of Benthams, are not compatible with this determination. Up to the early sixties there is no evidence that any Mexican hawthorns were in cultivation in Europe except those of Lambert's (Lord Napier's) introduction; but about that time, according to K. Koch,† the tree was reintroduced in what appeared to be the wild state. No further reference, however, to this second introduction has been found. The plant remained a rarity in gardens to which little attention was paid.

The following specimens taken from trees cultivated in Europe are at Kew:—

1. London Horticultural Society's Garden, 1838 (Herb. Benth.) sub *Crataegus mexicana*. Has long shoots with lobed leaves and large foliaceous stipules.

2. Chelsea Physic Garden. Three sheets (*a*) fruiting, leaves coarsely dentate to sublobed, sub *C. Crus-galli*, coll. Nov. 1899; (*β*) fruiting, leaves as shown in Bot. Reg. t. 1910, one long shoot with coarsely dentate or sublobed leaves, and large stipules, as in London Arboretum et Fruticetum, ii. 867, fig. 617, sub *Crataegus stipulacea*, coll. Sept. 1900; (*γ*) flowering, exactly like Bot. Reg. 1910, sub *Crataegus stipulacea*, coll. June, 1904.

3. Paris, Botanic Garden; fruiting, leaves as in the Chelsea specimen (*γ*), but more lanceolate; long-shoot with stipules and leaves as in Chelsea specimen (*β*); barren short shoot with small lanceolate leaves as in Bot. Reg. t. 1910 (the lower branchlet on the left side), very like Humboldt and Bonpland's figure, but very sparingly hairy, all these collected 1899 and grown as *C. stipulacea*, Steud.

4. Kew, specimen received from Paris, 1891, no. 123, (*a*) barren

\* K. Koch, Dendrologie, i. 132-134 (1869).

† K. Koch in Wochenschr. f. Gärtnerei u. Pflanzentkunde, vol. v. p. 363 and Dendrologie, p. 132.

long-shoot with coarsely dentate or (the uppermost) sub-lobed glabrescent leaves and foliaceous stipules; ( $\beta$ ) flowering shoot with large coarsely dentate glabrescent leaves, coll. 1901; ( $\gamma$ ) flowering and fruiting, leaves less coarsely dentate to dentate-serrate, with the teeth often small, glabrescent underneath, stipules narrow, linear, early deciduous, all from the same tree, sub *C. mexicana*, coll. 1913. The examination of this tree in the autumn of 1914 showed that the lobing of leaves and the presence of distinctly foliaceous stipules were confined to long-shoots growing up perpendicularly from the branches. All the other foliage was fairly uniform, except in size, and corresponded with the type represented in Sweet's Flower Garden, approaching also very closely to that shown in the Botanical Register, t. 1910.

5. Hort. Segrez, a flowering branch with very coarsely dentate to sublobed, almost glabrescent leaves and narrow foliaceous stipules, leaf-bases markedly cuncate, grown as *Crataegus spathulata*,\* coll. May, 1885.

6. Hort. Ellacombe at Bitton; two flowering branches, the nearest approach to the type represented by Humboldt and Bonpland's figure and practically indistinguishable from it except for its more scanty tomentum; a long-shoot with coarsely dentate leaves and foliaceous stipules, just like the long-shoot in the Paris specimen; grown as *Crataegus mexicana*, coll. June, 1890.

None of these specimens possess spines; but there are spines of the ordinary type here and there on the Kew tree, mostly at the base of the long-shoots.

The form originally described by Humboldt and Bonpland, the area of which, as far as it can be ascertained from the material at Kew, is confined to the Mexican tableland from S. Luis Potosi to the Federal District of Mexico, I shall call f. *Humboldtii*. The question arises now, what evidence is there that the form cultivated in Europe—we may call it conveniently f. *stipulacea*—occurs in Mexico? There are, to begin with, two specimens at Kew, collected in Mexico, which may be considered good representatives of it. One is the flowering branch already mentioned as issued with a small leaved fruiting branch under C. G. Pringle's no. 11,440 and collected in open woodlands near Es laba (2660 m.) in the Federal District; the other a flowering specimen, C. G. Pringle, 6547, from the base of the Sierra of Ajusco (2600 m.), also in the Federal District, both having been distributed as *Crataegus stipulosa*, Steud. The only difference that might be pointed out as existing between them and the *C. stipulacea* of gardens is in the slightly denser tomentum of the leaves. It will be observed that both specimens come from the very area of the f. *Humboldtii*, but there is no indication of their having been taken from cultivated trees.† In less complete agreement with that form are the following specimens arranged geographically:—

*Hidalgo*. 1. C. G. Pringle, no. 6631, river banks near Tula

\* The true *C. spathulata* is *C. cuneata* Sieb. et Zucc., of Japan.

† Eggleston, speaking of *Crataegus* in Mexico generally, says "the trees are guarded as carefully as other fruit trees are with us" (Bull. Torr. Bot. Club, xxxvi, p. 504), and there is no evidence that they are actually cultivated on anything like a large scale.



(2300 m.). (2) A barren branch with long spines and leaves varying from obovate-cuneate to elliptic-oblong, and, on the short-shoots, to lanceolate-oblong, dentate-crenate or serrate, fairly hairy below and provided with narrow foliaceous stipules; branches with very similar foliage occur occasionally on the Kew tree: (3) a fruiting branch with small leaves, mostly elliptic oblong and often quite obtuse, 2-4.5 cm. by 1.2-2.2 cm., or even smaller; the leaves resemble those of the barren branch of the Paris specimen described above, but they are more obtuse.

2. Coulter, no. 84, Real del Monte. This locality is situated very close to Moran, the locus classicus of *C. pubescens*. The leaves are elliptic to elliptic-oblong, obtuse, very minutely crenate-dentate and accompanied by broad foliaceous stipules. The specimen is in flower. Similar leaves occur very rarely in the cultivated f. *stipulacea*.

Puebla. 3. Liebmann, Guinantla (2100 m.). A fruiting branch, intermediate between Coulter, no. 84, and f. *Humboldtii*.

Vera Cruz. 4. Galeotti, Jalapa. A flowering branch; leaves lanceolate-oblong, subacute, distinctly and unequally crenate in the upper part, 4-5 cm. long, 1.5-1.8 cm. wide, glabrescent.

5. Linden, no. 656, April, 1838, la Hoya los Vigas. A small flowering branch, very like Galeotti's.

6. C. G. Pringle, no. 8081, thickets about Jalapa (1300 m.), March, 1899. Two flowering branches and a young long-shoot with obtusely three-lobed leaves. The corymbs terminate either short-shoots with very narrow early deciduous stipules or long-shoots with foliaceous and more persistent stipules. The range of variation in the shape of the leaves of the flowering pieces is very great, being from obovate to elliptic and lanceolate. The leaves are mostly obtuse, their crenation or denticulation is distinct, with traces of lobing, and their tomentum is scanty. They measure 3-5 cm. by 1.5-4 cm. and their texture is rather thin.

7. Botteri, no. 831, Febr. 1854, Orizaba. A fruiting branch; leaves elliptic-oblong to oblong, obtuse, crenate, rather tomentose beneath, up to 4 cm. by almost 3 cm.

Morelos. 8. C. G. Pringle, no. 6983, fields about Tepoxtlán (2250 m.); a large tree. Flowering branch with mostly broad-oblong and obtuse or acute leaves with small crenae and foliaceous cultriform stipules, blades 4-8 cm. by 2.5-4 cm. Barren armed branch with smaller, more acute and, lower down, narrower almost oblanceolate leaves. Similar foliage occurs in the Kew tree, except that the crenation is rarely so minute.

We thus find that the Mexican hawthorn of European gardens occurs in a practically identical condition within the natural area of *Crataegus pubescens* (*Mespilus pubescens*, H.B.K.), while forms more or less like it extend beyond it on to the outer slopes of the Mexican table-land. But we have at present no means of working out the genetic relations that exist between this f. *stipulacea* and the original *C. pubescens*, that is, the f. *Humboldtii* on the one hand and the modifications which are covered by some of the specimens mentioned above (1-8). There occurs no doubt a good deal of variation in the same individual, probably mainly due to conditions of nutrition and insolation, and it may be assumed that the

same factors would assert themselves in the development of the pure-bred progeny, producing individuals differing perhaps as much as those that have just been described. To define these limits of fluctuation it would be necessary to experiment and to observe in the field. Meanwhile the taxonomist will have to be satisfied with describing and disposing the forms in such a manner that they can be recognised and named with a fair degree of certainty. His task will, in the circumstances, be of an essentially practical, and at the same time preliminary, nature. To treat all the modifications he can distinguish in his collections as independent units would be as little justified as to neglect them altogether on the assumption that they are the expression of an inherent instability.

All we can assert at present with respect to the Mexican Hawthorn amounts to this:—There is a tree in cultivation, known as the Mexican Hawthorn, and designated variously *Crataegus stipulacea* and *C. mexicana*. It is, in spite of a certain instability of some characters, mainly connected with the foliage, a fairly homogeneous and easily recognisable unit. It has its counterpart in the wild state in Mexico. It is associated there with a number of slight modifications which cannot, from the very limited material at our disposal, be readily and reliably distinguished from it, but at the same time also with a form which is sufficiently differentiated to be recognised by the combination of its characters as something different. This form has been described and figured as *Mespilus pubescens*.

The differences mainly affect vegetative characters which are known to be individually unstable, and may be assumed to be subject to the influence of external factors. Nothing is known from the standpoint of heredity and hybridisation as to the behaviour of the plants under consideration, and consequently as to their genetic relations. Taxonomically this condition would seem to find its rational expression in this way.

<i>Crataegus pubescens</i> (as species)	f. <i>Humboldtii</i> , occasionally verging towards f. <i>stipulacea</i> .
	f. <i>stipulacea</i> , including slightly aberrant modifications of
	f. <i>stipulacea</i> .

The first attempt to classify the species of *Crataegus* subsequent to De Candolle, was K. Koch's.\* Among the forms dealt with in his article he distinguished the following species: (1) *C. Loddigesiana* (*Mespilus stipulacea* Desf., M. Loddigesianus, Spach); (2) *C. mexicana*; (3) *C. hypolasia* (*C. Lambertiana*, Hort., *C. mexicana* D. Don, Sweet's Brit. Fl. Gard, haud aliorum); (4), *C. pubescens* (*Mespilus pubescens*, H. B. K.); (5) *C. stipulacea* (*C. stipulosa*, Steud., *Mespilus stipulosa*, H. B. K.); (6) *C. quitensis* Benth. In the Appendix to his paper (p. 299) his *C. hypolasia* is reduced to *C. mexicana*, to which he also refers *C. subcrenata*, Benth., a name not previously mentioned by him. I shall have to refer to *C. stipulosa*, *C. quitensis*, and *C. subcrenata* later on. As Koch had not seen any specimens of the species mentioned except

\* K. Koch in Verh. Verein. Beförd. d. Gartenbau N. Ser. i. (1853) pp. 221-312.

one collected by Mociño and Sessé, and one of *C. subcrenata*, his classification as outlined above may be passed over. Nine years later\* he made another attempt, uniting *Mespilus*† *Loddigesiana* and his own *Crataegus hypolasia* with *M. mexicana* (the latter a new combination based on *C. mexicana*, DC.), and Bentham's *Crataegus suberrata* with *M. pubescens*, which like *M. stipulosa* and *M. quitensis* (a new combination for *Crataegus quitensis*) he retained as distinct species. The same classification is employed in his "Dendrologie" (1869), with the exception of the disappearance of *M. quitensis*.

Why *M. pubescens* should be distinct from *M. mexicana* is not clear from his description, which moreover hardly fits Humboldt and Bonpland's plant, and was apparently drawn up from a "*stipulacea*" plant which he saw in France.

The first to recognise the identity of Humboldt and Bonpland's and Mociño and Sesse's plant was E. Regel‡ in 1871, but he also extended the conception of species so as to include *C. suberrata* and *C. quitensis*, and made no attempt to distinguish forms within it. Dippell§ adopted the same view with the exclusion of *C. quitensis*. More recently Eggleston§ published a paper on "The Crataegi of Mexico and Central America," which is mainly based on the study of an ample American material. Unfortunately only a small portion of the specimens quoted by him are represented at Kew. He distinguishes (1) *C. pubescens* (*Mespilus pubescens*, H. B. K.). This is certainly not Humboldt and Bonpland's plant, and corresponds more or less to my *f. stipulacea*. (2) *C. pubescens*, Botteri. This again is evidently one of the "modifications" of *f. stipulacea*, if the Kew specimen of Botteri, no. 831, from Orizaba, can be depended upon as being identical with Botteri, 1121, quoted by Eggleston. (3) *C. mexicana* (including Lindley's and D. Don's plants, figured under that name, and *C. suberrata*, Benth). This includes representatives of both *f. Humboldtii* and *f. stipulacea*. (4) *C. mexicana microsperma*. The original of this in habit and foliage very much resembles Parry and Palmer, no. 228, which Eggleston enumerates under *C. mexicana*, and I have referred to *f. Humboldtii*; but it consists only of a fruiting branch, and the apparently quite mature fruits are much smaller than those of *C. mexicana*. The area from which Eggleston records it includes the states of Jalisco, Michoacan, Guerrero, and Oaxaca. It is also known as "Tejocote," and "a jelly is made from the fruit, resembling that from the quince." Eggleston adds, "this may prove a good species."

I have referred above to *Crataegus suberrata*, Benth., and *Mespilus stipulosa*, H. B. K. (*Crataegus stipulosa*, Steud.) as supposed synonyms of the Mexican Hawthorn. *Crataegus suberrata* was described from specimens collected by Hartweg in

\* K. Koch in Wochenschrift f. Gärtnerei u. Pflanzenkunde, vol. v. (1862).

† He extended in this place *Mespilus* so as to include *Crataegus* in it as a subgenus.

‡ E. Regel in Act. Hort. Petrop. vol. i. p. 107.

§ Dippel, Handb. d. Laubholzkunde, vol. ii. 426.

§ W. W. Eggleston in Bull. Torr. Bot. Club, vol. xxxvi, pp. 501-514.



Guanajuato (no. 47), in 1836. Eggleston, who saw a specimen of it in the Gray Herbarium, says that it, "seems to represent a rather entire-leaved form of *C. mexicana* which . . . is not worthy of even a varietal name." In my opinion, it is one of those slight "modifications" which I have, in the absence of better evidence, treated under *f. stipulacea*. The case of *Mespilus stipulosa*, is somewhat different. It was described from specimens collected by Humboldt and Bonpland in the valley of Chillo, near Quito, in 1802. About thirty years later it was collected again in the very same locality by Col. Hall. There are two sheets of his collecting at Kew, representing the plant in flower, and named *Mespilus stipulosa*. They are labelled:—a "*Mespilus*, found in the valley of Chillo, near Alangasi, elevation 8400 feet. Fruit pyriform, yellowish-green. A small tree." "*C. mespilus*—The valley of Chillo, about 8000 ft., corolla white, fruit pyriform, green." Ten years later it was once more collected there, this time by Hartweg, in 1842, the collector noting that it was "a shrub or small tree, 10–20 feet high. In the 'quebrada' (ravine) de San Marcos á Guito; in the valley of Chillo near Puenbo." This specimen consists of a branch with several gnarled branchlets, one of which bears a ripe fruit, whilst another has a two-flowered inflorescence. It formed the material from which Benthams\* described his *Crataegus quitensis*. There can be no doubt in my opinion that it is identical with Humboldt and Bonpland's *Mespilus stipulosa* (*Crataegus stipulosa*, Steud.). Eggleston identified with it a number of specimens from Guatemala and, with some reserve, from the neighbouring State of Chiapas. The corresponding Kew material (J. D. Smith, 2531, from Sacatepéquez, Guatemala; Skinner, coll. 1857, Guatemala; Ghiesbreght, 630, Chiapas) fully bears out his determination. It is difficult to distinguish from *C. pubescens*, as understood here, the principal difference is seen in the more pubescent upper surface of the leaves and their slightly more numerous (7-8 instead of 4-7) nerves, which are more densely whitish-hairy below, and therefore more conspicuous. The leaves vary a great deal in size and shape, but they are very rarely lanceolate, and show no tendency to lobing. All the fruits with the Kew specimens, whether from Ecuador or Central America, have persistent calyces, not deciduous, as Eggleston says. However, I see no reason why, in the present state of our knowledge, *C. stipulosa* should be reduced to *C. pubescens*, the more so as it inhabits a definite area apart from that of *C. pubescens*. The synonymy of *Crataegus pubescens* is therefore as follows:—

*Crataegus pubescens*.

<i>f. Humboldtii</i> .	<i>f. stipulacea</i> .
1824 <i>Mespilus pubescens</i> , H. B. K.	1826 <i>Crataegus stipulacea</i> , Lodd.
1825 <i>Crataegus mexicana</i> , DC.	1834 <i>Mespilus stipulacea</i> , Desf.
1909 <i>C. pubescens</i> , Eggl. p.p.	1834 M. Loddigesiana, Spach.
1909 <i>C. mexicana</i> , Eggl. p.p.	1835 <i>Crataegus mexicana</i> , D. Don.
	1843 <i>C. subserrata</i> , Benth.
	1853 <i>C. hypolasia</i> , K. Koch
	1862 <i>Mespilus mexicana</i> , K. Koch
	1909 <i>Crataegus pubescens</i> , Eggl. p.p.
	1909 <i>C. pubescens</i> var. Botteri, Eggl.
	1909 <i>C. mexicana</i> , Eggl. p.p.

\* Benthams, Plantae Hartwegianae, p. 173 (1843).

Before concluding these remarks I have to refer to certain species proposed by Sessé and Mocino. It has already been pointed out that they referred the "Texocotl" of the Mexicans to *Crataegus Crus-galli* in their "Plantae Novae Hispaniae" (p. 78); but they describe in the same place three more species of *Crataegus*, two of which, to judge from the descriptions, are very probably mere forms of *C. pubescens*. They are: (1) *C. indica*, an unarmed plant with lanceolate leaves, serrulate from the middle upwards and villous below, and with subulate bracts, collected at S. Rosa, near Guanojuato; (2) *C. inermis*, also unarmed, with elliptic entire leaves, tomentose below, and with subulate purplish bracts, collected near "Michaelopolitanum." The third, *C. minor*, characterised by very small setaceous-mucronate leaves and small flowers, is evidently quite distinct. The same descriptions appear in the author's "Flora Mexicana" (ed. ii., p. 125), which was published in 1894. Of *C. inermis* a figure (t. 349) is said to exist in their collection of drawings at Madrid. An inspection of that plate and of the specimens, if such exist, will in the future solve the question of their identity: but this much seems to be certain; they cannot well belong to any other of the Mexican species enumerated by Eggleston.

## LVII.—MISCELLANEOUS NOTES.

MR. CHAMBERLAIN AND KEW.—The Right Honourable Mr. Austen Chamberlain writes to the Director:—

"Thank you very much for sending me the *Kew Bulletin* with Sir W. Thiselton-Dyer's memorial notice of my father's connection with the Gardens.

"I do not know whether you are aware of the full story of the completion of the Temperate House to which he alludes. One afternoon in the House of Commons Sir William Harcourt, then Chancellor of the Exchequer, asked my father to pair with him for dinner. My father replied that he was afraid he could not do that as he was intending to speak on the motion which was then before the House.

"'Oh!' said Sir William, 'don't do that, for if you speak I shall have to stop and reply, and I particularly want to keep my engagement this evening.'

"'Well,' replied my father, 'I will make a bargain with you if you like. If you will agree to put money in next year's estimates to complete the Temperate House at Kew I will pair with you for as long as you wish.' And Sir William Harcourt, nothing loath, assented.

"My father at once communicated this to Sir William Thiselton-Dyer; but when the next year's estimates came out Sir William found to his horror that the money for the Temperate House had been struck out. He appealed to my father, and my father to Sir William Harcourt, and the Chancellor, recognising that a bargain was a bargain, directed that a supplementary estimate should be brought in to provide the promised funds,

"I once suggested to the present Mr. Lewis Harcourt that this characteristic Parliamentary anecdote should be recorded on the Temperate House itself."

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**Kew and the War.**—Of the two hundred and five men serving in various capacities on the staff of the Royal Botanic Gardens, one hundred and fifty are between the ages of 18 and 45. Of these up to the present forty-six are now serving with His Majesty's forces on land or sea. At the outbreak of hostilities ten men, Reservists and Territorials, were summoned to the colours. Two of these were members of the Royal Fleet Reserve, and two members of the Territorial force.

Four ex-soldiers have rejoined the colours as instructors in the New Army. Three of these were members of the uniformed section (two constables and one museum porter), and one from the labour force who had seen long service in India. Six ex-soldiers have also rejoined the ranks.

Twenty-six members of the staff have enlisted either in the Army itself or in the New Army since the beginning of the war, and the recruits have been as follows:—

Foreman, 1.	Herbarium Porters, 2.
Sub-foreman, 1.	Labourers, 6.
Young Gardeners, 10.	Carters, 2.
Garden Boys, 3.	Horse Boy, 1.

One of the young gardeners has already been promoted to the highest rank among the non-commissioned officers. It should be pointed out that one young gardener was already a member of the Territorial force, and is counted among those called out at the commencement of the war.

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**Transmission of Cuttings from Abroad.**—Some remarks on this question were published in the *Kew Bulletin* of the present year, see "Hints for Collectors," p. 98. Supplementing them, the following observations, suggested partly by directions given in a valuable publication of the United States Department of Agriculture, entitled "How to send living plant material to America," are now offered.

The term cutting should be taken to include also "scions," or pieces of living branchlets used for grafting. It is more often possible to establish imported twigs as grafts on stocks of an older species of the same genus than it is to make them take root on their own account. In selecting pieces to send, they should, if from deciduous trees, be sent in the winter or leafless state, and they may be nine inches or more long. Growths well ripened and of average vigour should be chosen, neither too gross and sappy on the one hand, nor too weak and twiggy on the other. Shoots scarcely the thickness of a penholder are on the whole the most convenient size for grafting, and in cases where the one-season wood is much more slender than that, two-season shoots should be sent. Cuttings for rooting are nearly always made of one-season wood. Shoots of woody evergreens, like hollies or oaks, if to be sent long journeys,

may have the leaves wholly or partially removed. One of the most important matters in connection with sending shoots for grafting or for cuttings is determining the right moistness of the sphagnum or other packing material. It should be moist but not saturated. The matter is, of course, dependent to some extent on the nature of the wrappings and their capacity for preventing escape of moisture, but the mistake of making the packing material too wet is more often made than is the reverse.

A useful method, especially when the cuttings have to be sent long distances, is to pack them in a ventilated box, with their ends (both top and bottom) bedded in clay balls, the middle part uncovered. The box should be of the right size to enable the cuttings to be packed across it all one way so that the clayed ends fit against the sides. In this way the uncovered middle part of the cuttings is in free air, and "sweating" is prevented.

Cuttings that arrive in a shrivelled but still living state should be submerged in water for a few hours to regain their plumpness.

Examples of genera, of which leafless cuttings for rooting may be safely sent long distances are: *Salix*, *Populus*, *Rosa*, *Ribes*, *Neillia*, *Spiraea*, *Tamarix*, *Cornus*, *Forsythia*. Root-cuttings, if the collector can secure them, would be useful of such genera as *Rhus*, *Ailanthus*, and others with fleshy roots.

As a general rule, leafless cuttings for rooting should reach England as soon as possible after the leaves have fallen. Grafts and root-cuttings need not arrive until spring. It need hardly be said that every precaution should be taken not to introduce in this way a new insect or fungoid pest.

**Leafy summer cuttings** of hardy trees and shrubs have been very successfully transported from America to England in the month of July. The cuttings were tied in small bundles of half a dozen or so and laid loosely in shallow baskets with damp moss about the stems, the leafy parts being left uncovered. The basket was then tied down with canvas. It is, of course, only possible to send over cuttings in this way by arranging with the purser or other officer on board ship that they may be kept in the cool storage. For hardy things it was found that a temperature of about 42° Fahr. was very suitable. Cuttings ten days in transit have been found to root well, but perhaps a fortnight is about the limit for this class of cutting.

W. J. B.

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**Presentations to Museums.**—The following miscellaneous specimens have been received in addition to those previously recorded in the *Bulletin*:—

Mr. R. B. Rogers, Launceston.—Two photographs of naturally inarched branches of poplar, section of wood of green oak, and three large bunches of fruits of common walnut.

Curator, Botanic Station, Tobago.—Pods of *Canavalia caribaea*.

Mr. J. Harris, Swansea.—Section of trunk of *Rhododendron Falconeri*.

Director, Botanic Gardens, Singapore.—Photograph of selected tubers of varieties of *Manihot*, and two photographs of old tree of *Hevea brasiliensis* that had recently died in the Botanic Gardens, Singapore.



Mr. J. Yule, Cavendish Square, London.—Sample of coca leaves (*Erythroxylon Coca*) grown in North-East Rhodesia.

Mr. E. R. Pratt, Downham, Norfolk.—A collection of various woods including examples of cricket-bat willow grown under different conditions, also mounted specimens of species of *Salix*.

Sir A. H. Church, Kew Gardens.—Piece of cedar wood from the small temple at Nimroud.

Mr. A. Wigglesworth, London, E.C.—Sample of Indian (Baihata) flax.

Mr. W. P. Ellmore, Leicester.—Photograph of a willow-peeling scene.

His Grace the Duke of Richmond and Gordon, Gordon Castle, Fochabers.—Section of trunk of Scots pine, planks of larch, oak, Scots pine, also turned articles in yew and elm, steering wheel of oak and specimens of boat-building timber.

The Right Honourable the Earl of Moray, Darnaway, Forres.—Planks of Scots pine, larch, spruce, elm, sweet chestnut, beech, etc.

Sir John Stirling Maxwell, Bart., Pollok House, Pollok-shaws.—Six photographs of high moorland planting.

The Marchioness of Graham, Easton Park, Wickham Market.—Plank of *Populus nigra*.

Sir John Dewar, Bart., Dupplin Castle, Perth.—Examples of mining timber, fencewood, sleepers, etc.

The Right Honourable the Earl of Leicester, Holkham Hall, Norfolk.—Examples of timber of Corsican pine grown on sand dunes, also mangle rollers and wooden shovels made on the Estate.

Director, Forest Department, Siam, per Phra Vanpruk.—A collection of fifty-two specimens of Siamese woods.

From the International Rubber Exhibition a large and varied collection of vegetable products was obtained from the following sections:—

Sudan Government.—Acacia gums, varieties of sorghum, cotton, rubber, oil seeds and oils, tree of *Acacia Senegal* with exuded gum attached, etc.

British Guiana.—Rubber, coffee, cacao, rice, nutmegs, etc.

West Indies, St. Vincent.—Samples of cotton, arrowroot, cacao, etc.

St. Lucia.—Sugar, nutmegs, mangoes, etc.

Dominica.—Coffee, rubber, vanilla, etc.

British Honduras.—Fibres, rubber, oil seeds, oils, etc.

British East Africa.—Cotton, coffee, fibres, rubber, etc.

Nigeria.—Gums, cotton, photographs, etc.

Ceylon.—Cocoa-nut products, rubber, tea, cacao, photographs, etc.

French Colonies.—Rubber, rice, cotton, etc.

Philippines.—Fibres, etc.

J. M. H.

**Dichaeas from Costa Rica.**—Living plants of several interesting Costa Rican Orchids, which had been collected in the neighbourhood of Cachi, were sent to Kew by Mr. C. H. Lankester in October, 1913. Among them are two very imperfectly known

species of *Dichaea*, which prove to be *D. histrio*, Reichb. f., and *D. brachypoda*, Reichb. f. The genus is very rarely seen in cultivation, and the identification of the plants has revealed a good deal of confusion which it is desirable to clear up.

*Dichaea histrio*, Reichb. f., was primarily based on a drawing by Lindley of a plant which flowered in the garden of the Horticultural Society at Chiswick in October, 1856, and which is said to have been sent from Mexico by Botteri. Lindley only made an enlarged sketch of the pedicel, lip and column, on a sheet containing a partly-coloured copy of an unnamed Brazilian drawing by Descourtilz, but he recorded that Botteri's plant was identical with the latter in the leaves and in the colour and the form of its parts. On another sheet in Lindley's Herbarium is a dried specimen collected at Jalapilla, Mexico, in October, 1854, by Botteri (n. 513), and with it a sketch of a flower from "Mexico, Graham," and these Lindley has labelled "*Dichaea echinocarpa*," but the determination must have arisen from a confusion, for *D. echinocarpa* was primarily based on the Jamaican *Epidendrum echinocarpum*, which is quite distinct. When Reichenbach described *D. histrio*, he remarked that it was identical with a plant that passed in commerce under the name of *Pachyphyllum procumbens*, which was a true *Dichaea*. This determination enables another doubtful plant to be cleared up, for this plant, though elsewhere recorded, has not been described, and has remained as an unknown *Pachyphyllum* down to the present. It may be added that Lindley's determination of Botteri's plant was accepted by Hemsley, who further overlooked *D. histrio*, and that the habitat of the latter is recorded in the Index Kewensis as "Venezuela."

The identity of Descourtilz's Brazilian drawing remains somewhat doubtful, but it apparently agrees with Brazilian specimens of *Dichaea muricata*, Lindl., also with *Limodorum pendulum*, Aubl., which Lindley wrongly included under his *D. echinocarpa*, a mistake which doubtless led Cogniaux to supersede *D. echinocarpa* instead of *D. muricata*, Lindl., by the new name of *D. pendula*, Cogn. *D. histrio*, Reichb. f., is nearly allied to *D. muricata*, but has invariably smaller, more closely arranged, leaves than the Brazilian plant.

The following is the revised synonymy of the species:—

*Dichaea histrio*, Reichb. f. in Nederl. Kruidk. Arch. iv. (1859), p. 330. *D. echinocarpa*, Lindl. Gen. & Sp. Orch. (1833), p. 208, in part; Hemsl. Biol. Centr. Amer. iii. p. 268, in part. *Pachyphyllum procumbens*, Lodd. Orch. (1844), p. 39; Loud. Hort. Brit. Suppl. 3, p. 601; Reichb. f. in Nederl. Kruidk. Arch. iv. p. 329.

*Dichaea brachypoda*, Reichb. f., Beitr. Orch. Centr. Amer. (1866), p. 78, was based on a specimen collected at San Miguel, Costa Rica, by Wendland, in May, 1857, the collector describing the flowers as light green with reddish spots. The species was said to be allied to *D. graminoides*, Lindl. (*Isochilus graminoides*, Hook. Exot. Fl. iii. t. 196), and the plant sent by Mr. Lankester agrees so well with the description as to leave little doubt as to its identity.



Further material of Central American Dichaeas, especially living plants or dried specimens with flowers, would be appreciated, as there are imperfect specimens at Kew which may indicate additional species, and others have been described which cannot be identified for want of materials. R. A. R.

**Botanical Magazine for October.**—The following plants are figured: *Ixora umbellata*, Valet. (t. 8577); *Cytisus pallidus*, Poir. (t. 8578); *Trichocaulon pictum*, N. E. Br. (t. 8579); *Indigofera Kirilowii*, Maxim. (t. 8580), and *Agave bracteosa*, S. Wats. (t. 8581).

The *Ixora* was introduced to cultivation at Kew from Java in 1889, whence it was sent by the late Dr. Treub. It is nearly allied to *I. congesta*, Roxb., but differs particularly in the corymbs of white flowers. As a wild plant *I. umbellata* appears now to be very rare in Java. In cultivation it forms a handsome branching shrub.

*Cytisus pallidus*, a native of the Canary Islands, was raised at Kew in 1912 from seed sent in that year by Dr. G. V. Perez, of Puerto Orotava, Teneriffe. This plant has been depicted by Webb and Berthelot under the name *Genista splendens*, in their work on the Canary Islands. It is nearly allied to *C. linifolius*, Lamk., from which it differs in the broader leaflets. It is a particularly pleasing plant with its silvery pubescent leaves and fragrant yellow flowers.

*Trichocaulon pictum* is a remarkable Asclepiad from Little Namaqualand, originally discovered by Dr. R. Marloth, and subsequently found again by Prof. H. H. W. Pearson and sent to Kew with many other interesting succulents collected during the course of the Percy Sladen Expedition. In the vegetative condition our plant can hardly be distinguished from *T. cactiforme*, N. E. Br., but so distinct are the flowers that they cannot be regarded as conspecific. It flowered at Kew for the first time in June, 1912.

To China we are again indebted for another pretty garden shrub. *Indigofera Kirilowii*, a native of North China, has been received both from Mr. M. L. de Vilmorin and from Prof. Sargent. The flowers are a delicate pink colour, and are developed continuously from the leaf axils during June and July. This species was referred first by Bunge to *I. macrostachya*, but its nearest ally appears to be *I. elliptica*, Roxb.

*Agave bracteosa*, the subject of the last plate, is a very distinct species of the section *Littaea*. *A. pruinosa*, Lemaire, is its nearest ally, and has similarly finely dentate leaves, but in *A. bracteosa* the leaves gradually taper upwards from a short thickened base. This species was discovered by Dr. E. Palmer near Monterey in Northern Mexico, and was introduced by him to the Harvard Botanic Garden, where it flowered for the first time in 1881. The plant which furnished material for the plate was received in 1888 from the Botanic Garden at Washington.

**Solanum Wrightii.**—A specimen of *Solanum Wrightii*, Benth., has been received from Mr. C. J. Lucas, who has collected it at Ketito, about 50 miles from Nairobi, British East Africa, where it formed a tree 20 ft. high, with the branches spreading 15 ft., and was known as the "Tree Tomato." It was first described by Benthham in the *Flora Hongkongensis*, p. 243 (1861), from material obtained from the Murray Barracks, Hong Kong, by Charles Wright, naturalist to the United States North Pacific Exploring Expedition, during his visit there in 1854, and was then known as the "Potato Tree." The ground on which the barracks stood has now been built over and the tree probably destroyed, as specimens have not been sent by any subsequent collector. It has since been ascertained to be a native of Bolivia, whence specimens were received at Kew from Pearce, who collected it on the banks of the Amantala and called it the "Egg Tree," and at Guanai by M. Bang. Carrière, who published a good coloured figure of the plant in the *Revue Horticole*, 1867, p. 132, confused it with *C. macranthum*, but it differs totally from the two Brazilian species of that name described by Dunal and Hooker respectively. Dunal's plant is imperfectly known, while Hooker's has been reduced to *S. maroniense*, Poit. A third species described under the name *S. macranthum* by Martens and Galeotti is the Mexican *S. porphyranthum*, Dun.

C. H. W.

**Cauto Cotton.**—A brief account of this important plant was given in *Kew Bull.* 1914, pp. 198-199. The following additional particulars are furnished by Mr. W. Harris, Superintendent of Public Gardens and Plantations, Jamaica, in a letter dated July 16th, 1914:—

"Cauto Cotton is an interesting plant and promises to be a valuable agricultural crop for dry districts. Here, at Hope, it was planted in the middle of August last, and the crop was picked from the middle of February to 1st May this year, the yield being 600 lbs. of seed cotton per acre.

"The plants are growing at 8 feet by 8 feet, and had they been planted at 4 feet by 4 feet for the first year and then thinned out to 8 feet by 8 feet the yield would have been much heavier. They are now bearing a fine ratoon crop, and it is said that they yield good crops for at least three years.

"There are 50 acres of this crop on the limestone in Lower Clarendon, an exceedingly hot and dry district, and they have made excellent growth, even better than ours at Hope where the soil is a light gravelly alluvial.

"The yield of lint from some of the Clarendon cotton was 36 per cent., and the 1914 crop has been sold in U.S.A. at 18 cents per lb., whilst the ratoon cotton grown in Cuba and ginned in Jamaica was markedly superior to the plant staple and fetched 25 cents per lb."